



DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalagodu, Mysore Road, Bengaluru - 560074

Department of Computer Science & Engineering

ASSIGNMENT QUESTIONS-I

Academic Year:-2023-2024 (Odd sem)



Course Name:- Digital design & Computer Organization

Course Code: BCSJ02

Date of Given:- 8-1-2024

Semester : 3rd

Date of Submission:- 18-01-2024

Max.Marks:-10

Q No	Group-A (Roll No 1 – 22)	CO	RBTL
1	Simplify the following functions, and implement them with two level NAND gate circuits: $F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'$	1	1
2	With a neat diagram explain 3 to 8 line decoder. Write a Verilog code for Gate-level description of two-to-four-line decoder.	2	1
3	Realize the given function $f = b'c' + ab' + a'b$ using only 2 input NAND gates also only 2 input NOR gates.	1	3
4	Simplify the following Boolean functions by first finding the essential prime implicants: $F(w, x, y, z) = \Sigma(0, 2, 5, 7, 8, 10, 12, 13, 14, 15)$	1	2
5	Implement a Boolean function with a multiplexer. Write its logic diagram: $F(x, y, z) = \Sigma(1, 2, 6, 7)$	2	3
6	Write a HDL Verilog model of subtractor and simulate the same using basic gates.	2	2
Group-B (Roll No 23 – 45)			
1	With an example, explain the Four-bit adder-subtractor (with overflow detection).	2	2
2	Differentiate between combinational and sequential circuit.	1	2,3
3	Explain simplification of logic functions using map- entered variables. Implement the Boolean function $F(x, y, z) = \Sigma(0, 1, 3, 5, 6, 7)$ with NAND gates	1	3
4	Simplify the following expressions to sum-of-products and product-of-sums: $A'C' + B'C' + BC' + AB$	1	1
5	Reduce the following functions using K-map technique: $F(P, Q, R, S) = \Sigma m(0, 1, 4, 8, 9, 10) + d(2, 11)$	2	2
6	Write a HDL Verilog model of D-Flip flop and write test bench for it	1	2
Group-C (Roll No 46 – 68)			
1	Draw the logic diagram of the digital circuit specified by the following Verilog description <pre>module Circuit_C (y1, y2, y3, a, b); output y1, y2, y3; input a, b; assign y1 = a b; and (y2, a, b); assign y3 = a && b;</pre>	1	2



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Department of Computer Science & Engineering
Internal Assessment Test-I

Course Name: Digital design & Computer Organization
 Date 11/1/2024
 Semester & Section: III-A, B, C

Course Code: BCS302
 Time:
 Max marks: 40

*Note: Answer any Two full questions, choosing only One full question from each Module.
 Each full question carry maximum of 20 marks*

Q NO	Module-1 Questions	MARKS	CO	R
1.	a) Obtain the minimum product of sums for $f(w,x,y,z)=x'z' + wyz + w'y'z' + x'y$ using Karnaugh map & write the truth table and logic diagram.	10 M	CO1	
	b) Differentiate between combinational and sequential circuit. Draw the logic diagram corresponding to the following Boolean expression without simplifying it: $F = D + BC + (D + C')(A' + C)$.	10M	CO1	
OR				
2.	a) Explain simplification of logic functions using map- entered variables. Implement the Boolean function $F(x, y, z)=\Sigma(0, 1, 3, 5, 6, 7)$ with NAND gates, and draw the logic diagram of the implementation.	10M	CO1	1
	b)Mention the different Verilog HDL model and write the Verilog HDL code using structural model for the circuit & write the boolean function of the circuit & test bench for the model.	10M	CO1	
Module-2 Questions				
3.	a)With a neat diagram, explain 3 to 8 line decoder. Write a Verilog code for Gate-level description of two-to-four-line decoder	10M	CO2	
	b)Explain Four-bit carry lookahead adder using logic diagram with an example.	10 M	CO2	
OR				
4.	a) Implement the following Boolean function using 4:1 multiplexer $F(A,B,C,D)=\Sigma m(0,1,2,4,6,9,12,14)$. Explain in detail with truth table.	10M	CO2	1
	b) Implement the full adder with two half adders and an OR gate. And also draw the logic diagram of the digital circuit specified by the following Verilog description: <pre> module Circuit_A (A, B, C, D, F); input A, B, C, D; output F; wire w, x, y, z, a, d; </pre>	10 M	CO2	



Don Bosco Institute of Technology, Bangalore
 Kumbalagodu, Mysore Road, Bangalore 74
 Department of Computer Science and Engineering
 Internal Assessment Test - I
 SCHEME OF EVALUATION



Name of the Course: PDA CO
 Faculty Name: Champa.C.H

Course Code: BCS 302
 Date: 13/12/24

Semester: III
 Max Marks: 40

Q.No	SCHEME & SOLUTION	Marks
	<p style="text-align: center;">Module - 1</p> <p>1. a) Reduce using K-Map technique.</p> $F(P, Q, R, S) = \sum m(0, 1, 4, 8, 9, 10) + d(2, 11)$ <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> <p>- 3 -</p> </div> </div> $F = P\bar{Q} + \bar{P}\bar{Q}\bar{R} + \bar{P}\bar{R}\bar{S}$ <p style="text-align: center;">- 2 -</p> <p>Logic diagram:</p>	

Verilog code:-

```
module code (P, Q, R, S, F);
```

```
input P, Q, R, S;
```

```
Output F;
```

```
Assign F = (P & (!Q)) | ((!P) & (!Q) & (!R)) |
```

```
((!P) & (!R) & (!S));
```

```
End module
```

-3-

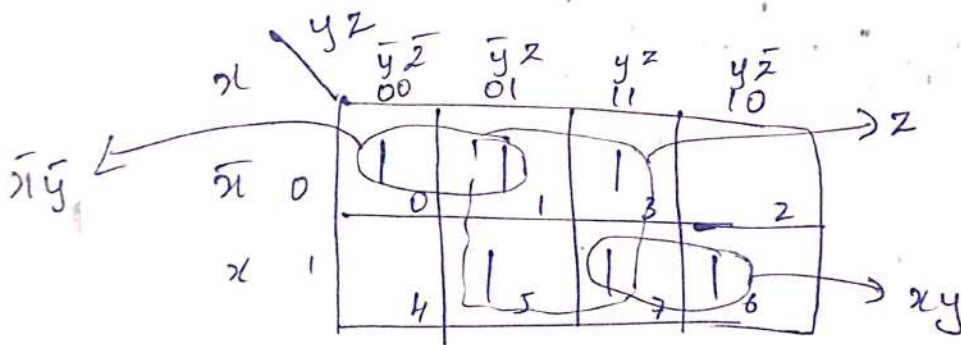
(b)

Simplify using KEMV

$$F(x, y, z) = \sum(0, 1, 3, 5, 6, 7)$$

-104-

Solⁿ:-

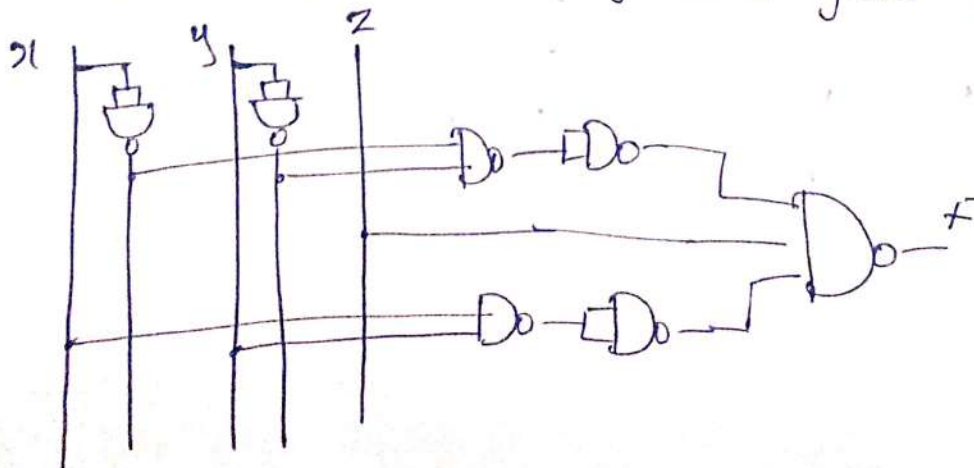


-3-

$$F = \bar{x}\bar{y} + z + xy$$

-2-

Logic Diagram using nand gates



-3-

Q.No

SCHEME

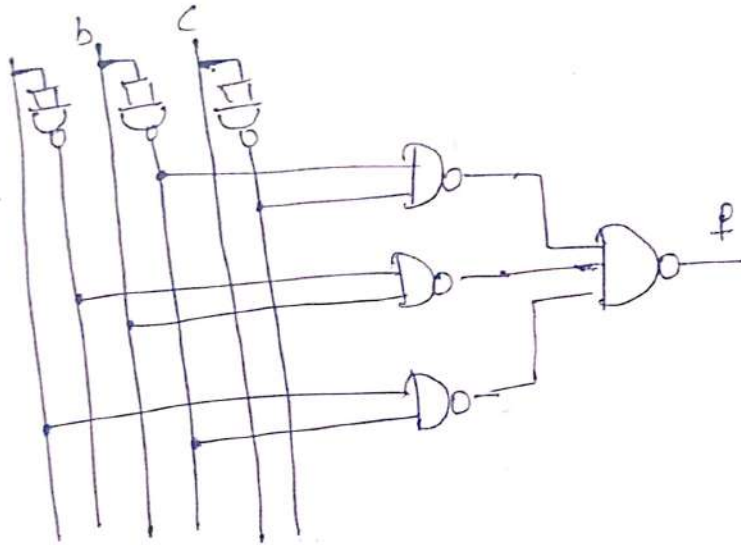
Marks

OR

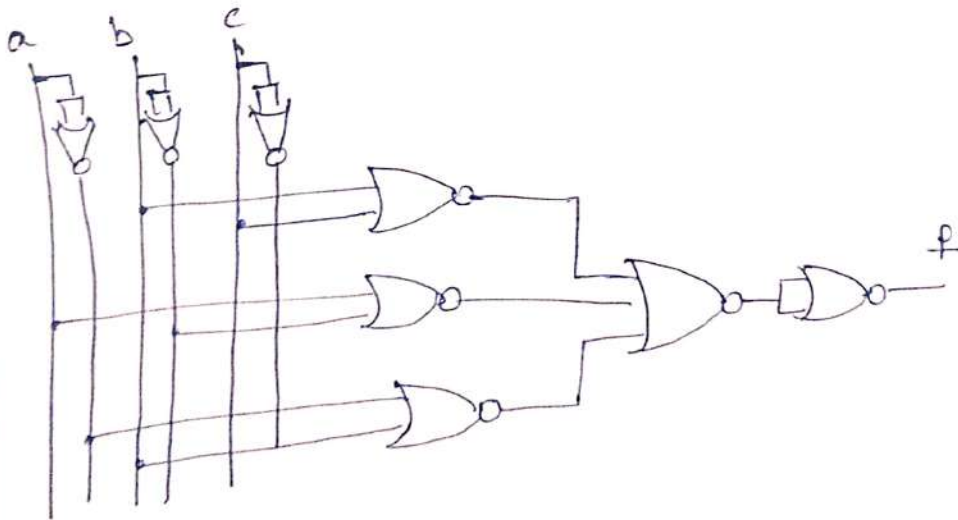
2a) $f = b'c' + ab' + a'b$ realize using
 2 ip and 4 2 ip NOR gates.

- 10H -

Solu:- a



- 5 -



- 5 -

0
Marks

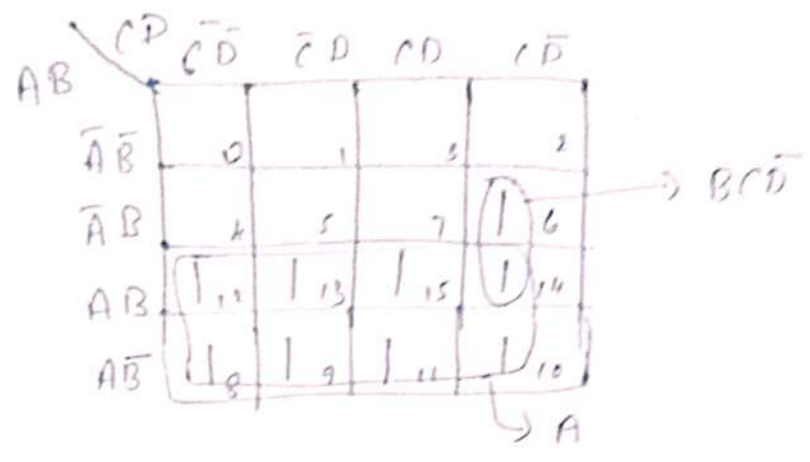
0H

2(b) SOP & POS ckt for

- 10M

$$F(A, B, C, D) = \sum m(6, 8, 9, 10, 11, 12, 13, 14, 15)$$

⇒



- 5M

SOP form: $F = A + B\bar{C}\bar{D}$

- 5M

POS form: $F = (\bar{A})(\bar{B} + \bar{C} + D)$

Module-2

3(a) Multiplexer defⁿ. 8:1 MUX using 4 i/p's and 4 OR gates. Write its TT & drawing diagram

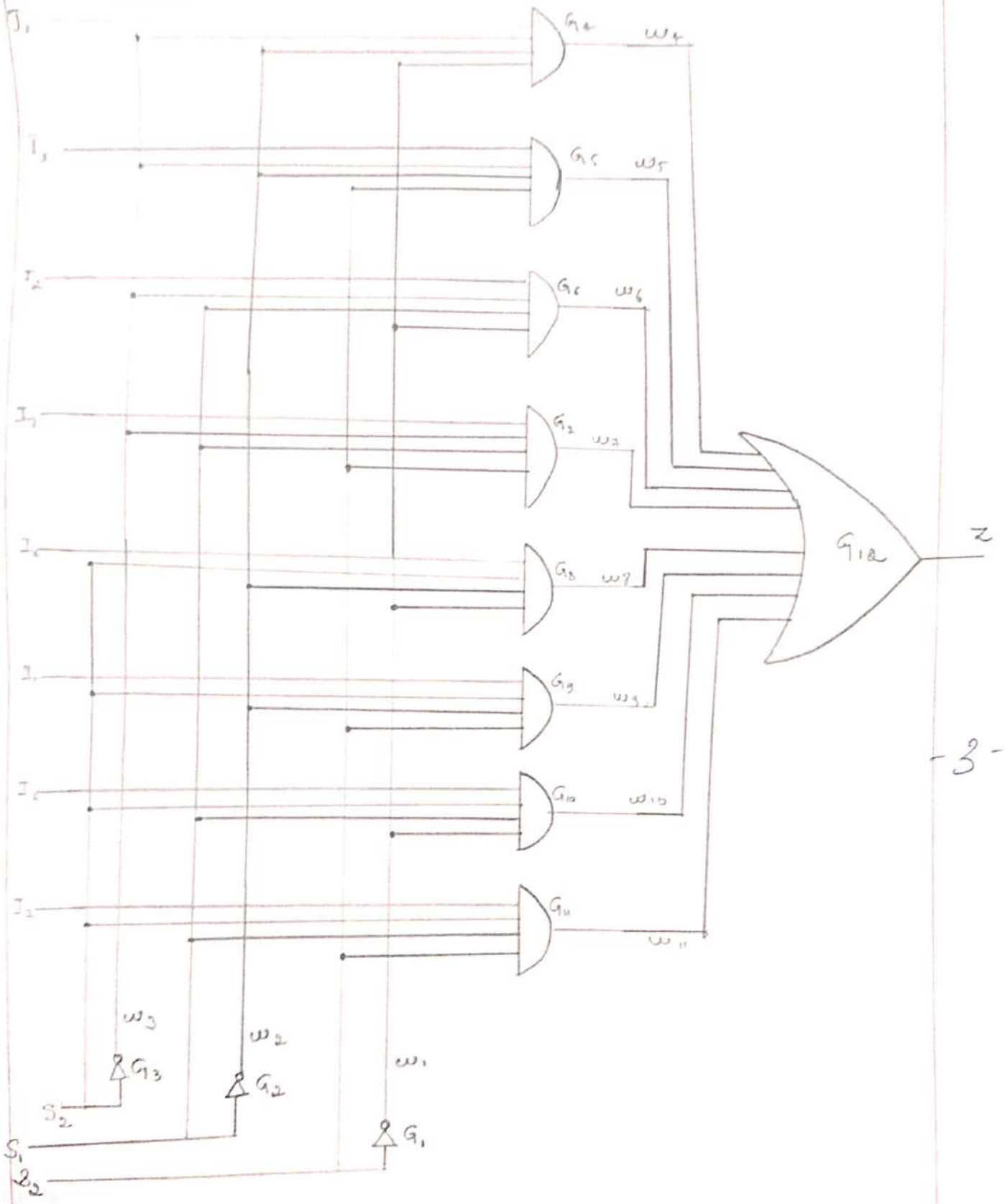
- 10M

Solⁿ: Multiplexer is many i/p's to one o/p.

- 2M

8:3 mux

Circuit Diagram



Verilog module.

```

module mux_2 (I0, I1, I2, I3, I4, I5, I6, I7, S0, S1, S2, Z);
input S0, S1, S2, I0, I1, I2, I3, I4, I5, I6, I7;
output Z;
wire w1, w2, w3, w4, w5, w6, w7, w8, w9, w10, w11;
not G11 (w1, S0);
not G12 (w2, S1);
not G13 (w3, S2);
and G14 (w4, w3, w2, w1, I0);
and G15 (w5, w3, w2, S0, I1);
and G16 (w6, w3, S1, w1, I2);
and G17 (w7, w3, S1, S0, I3);
and G18 (w8, S2, w2, w1, I4);
and G19 (w9, S2, w2, S0, I5);
and G110 (w10, S2, S1, w1, I6);
and G111 (w11, S2, S1, S0, I7);
or G112 (Z, w4, w5, w6, w7, w8, w9, w10, w11);
endmodule
    
```

- 3 -

Truth Table.

Input			output
S ₂	S ₁	S ₀	Z.
0	0	0	I ₀
0	0	1	I ₁
0	1	0	I ₂
0	1	1	I ₃
1	0	0	I ₄
1	0	1	I ₅
1	1	0	I ₆
1	1	1	I ₇

- 2 -

3(b)

3 to 8 line decoder, Verilog code for 2:4 line decoder.

10M-

Solⁿ:- Truth Table:- 3:8 line decoder.

I ₂	I ₁	I ₀	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	1	0
0	1	0	0	0	0	0	0	1	0	0
0	1	1	0	0	0	0	1	0	0	0
1	0	0	0	0	0	1	0	0	0	0
1	0	1	0	0	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0

3M-

Explanation

2M-

Verilog code for 2:4 line decoder:

```
module ab(I1, I2, E, D);
```

```
Output D[0:3];
```

```
input I1, I2;
```

```
input E;
```

```
wire w1, w2, w3;
```

```
not G1(w1, E);
```

2M-

not $G_2 (w_2, I_1)$;

not $G_3 (w_3, I_2)$;

nand $G_4 (D[0], w_1, w_2, w_3)$;

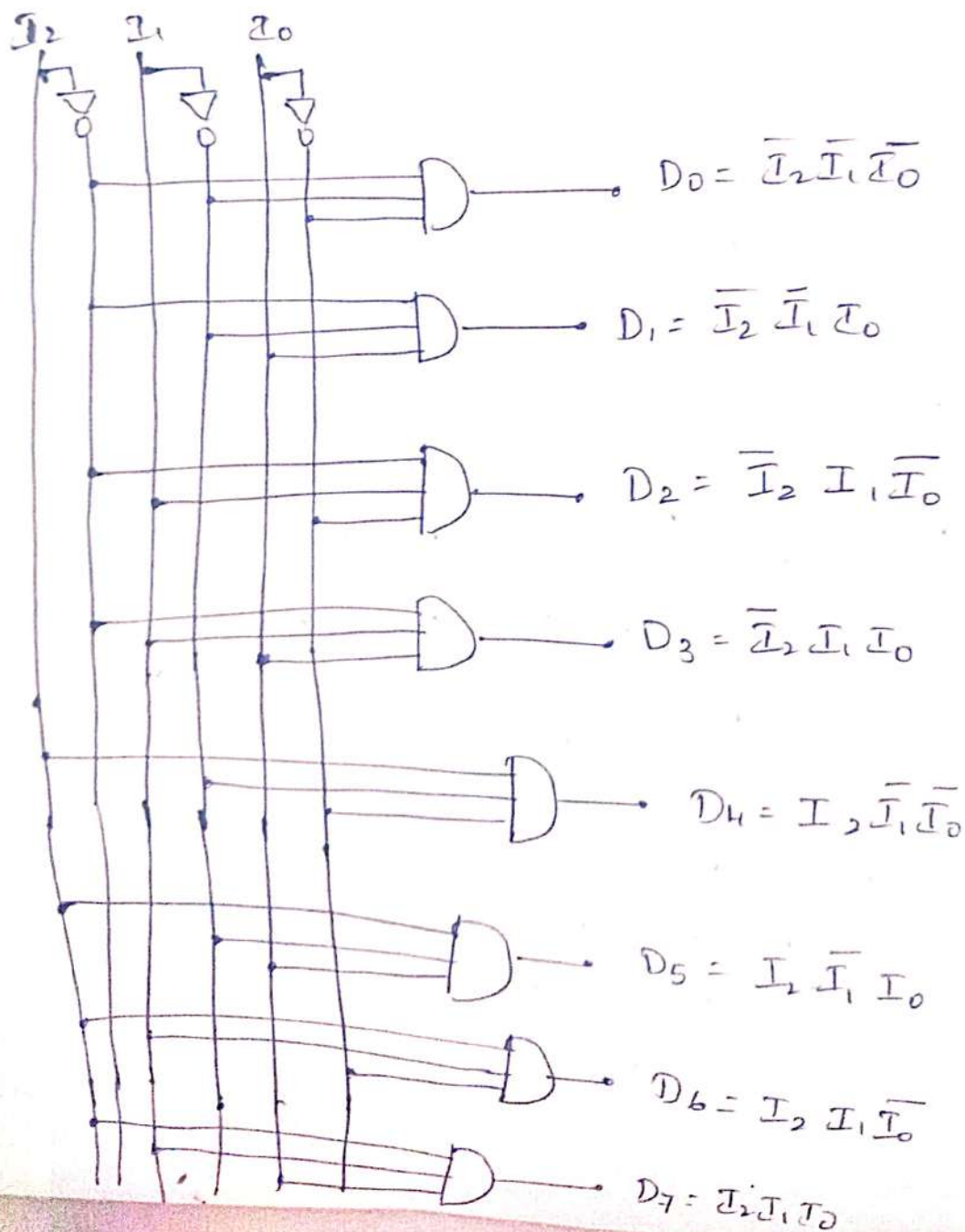
nand $G_5 (D[1], w_1, w_2, I_2)$;

nand $G_6 (D[2], w_1, I_1, w_3)$;

nand $G_7 (D[3], w_1, I_1, I_2)$;

End module

3:8 line decoder:-



- 34 -

Q1

4(a) JK Master Slave flip flop with T T A symbol. 10M.

Solⁿ:- module circuit (Y_1, Y_2, Y_3, a, b);

Output Y_1, Y_2, Y_3 ;

input a, b ;

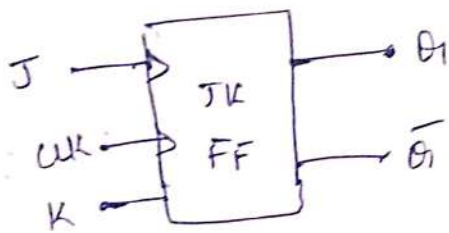
and $G_2 (Y_2, a, b)$;

and $G_3 (Y_3, a, b)$;

or $G_1 (Y_1, a, b)$;

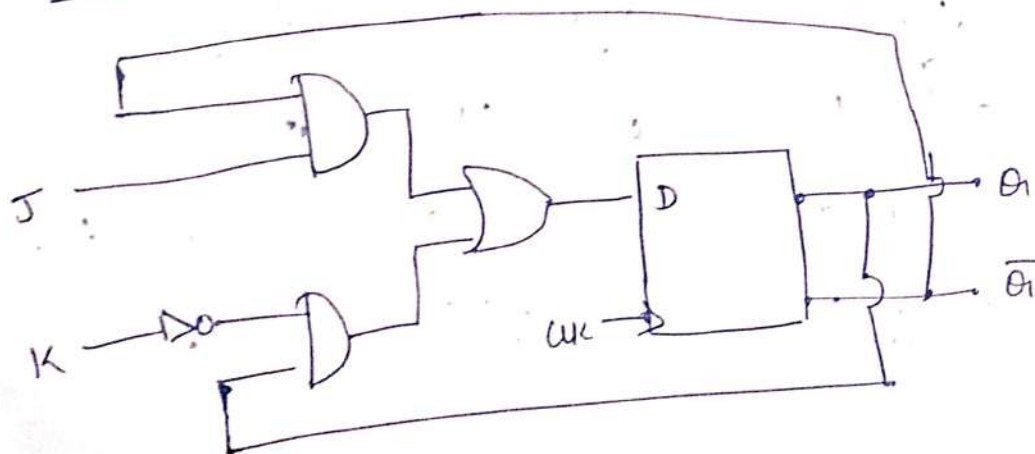
End module

JK flip flop:-



- 2 -

Ckt diagram:



- 3 -

Truth Table:-

J	K	D
0	0	0
0	1	0
1	0	1
1	1	$\bar{0}$

-3-

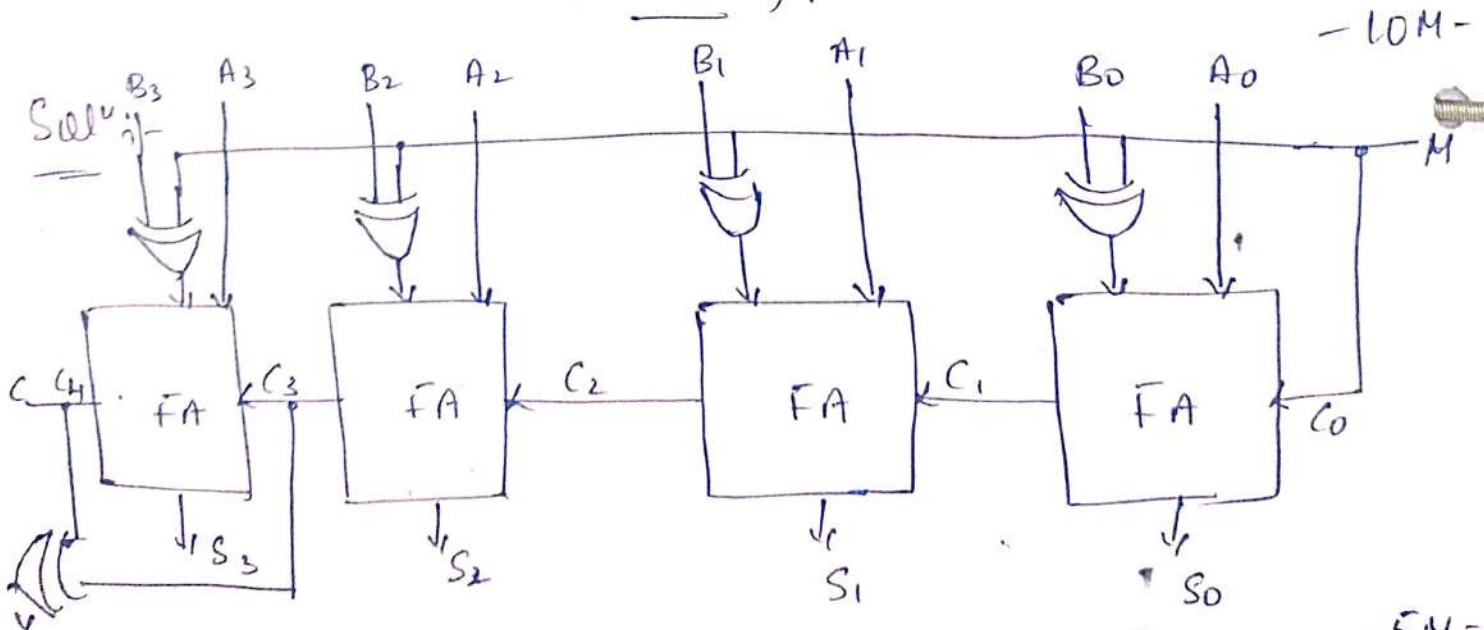
$$D = J\bar{0} + \bar{K}0$$

Explanation:-

-2-

Timing Diagram

4(b) 4-bit Adder-subtractor (with overflow detection)



-10M-

-5M-

Explanation with example

-5M-

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Lab → 25
 I A → 24
 249
 50

BLUE BOOK

Name: ABHISHEK.C

USN: IDB22CS001 SI.No: 7 (for First year - Students only)

Subject: D.D.&C.O. Subject Code: B.C.S302

Branch: C.S.E. Semester: 3rd Section: A

Test No	Date	Max. Marks	Marks Obtained	Signature of the Faculty
I	11.02.24	40	37	<u>CH</u>
II	28.02.24	40	39	<u>CH</u>
III	Assignment	20	20	
I A Marks (Average of three tests marks)		100	96	

Scaledown

25

24

Abhishek

Signature of the Student

Champa CH

Signature of the Faculty

Declaration by the Student:

- I know that I am not allowed to borrow any instruments/calculator/pen/pencil eraser/sharpener etc... From anybody in the test hall.
- I will not be indulging in any Malpractice / Violation of instruction by the Room Invigilator.
- In case of violation, I may be sent out of the Test & I may not be allowed to attend classes any more till I get my parents (no matter whether they stay in India or abroad) / I may be given T.C.
- For the period I am not allowed to classes. I know I will be losing the Attendance.
- Mobile phones are not allowed inside the examination hall

Abhi
Signature of the Student

	Q. No	1	2	3	4	5	6	7	8	Total
I Test	a	08		10						18
	b	10		09						19
	c									
	Total	18		19						37
Signature of the Faculty :		Cy								

	Q. No	1	2	3	4	5	6	7	8	Total
II Test	a	10		10						20
	b	09		10						19
	c									
	Total	19		20						39
Signature of the Faculty :		Cy								

	Q. No	1	2	3	4	5	6	7	8	Total
III Test	a									
	b									
	c									
	Total									
Signature of the Faculty :										

IA - 1

Module - 1

1 a) $f(w, x, y, z) = x'z' + wyz + w'y'z' + x'y$

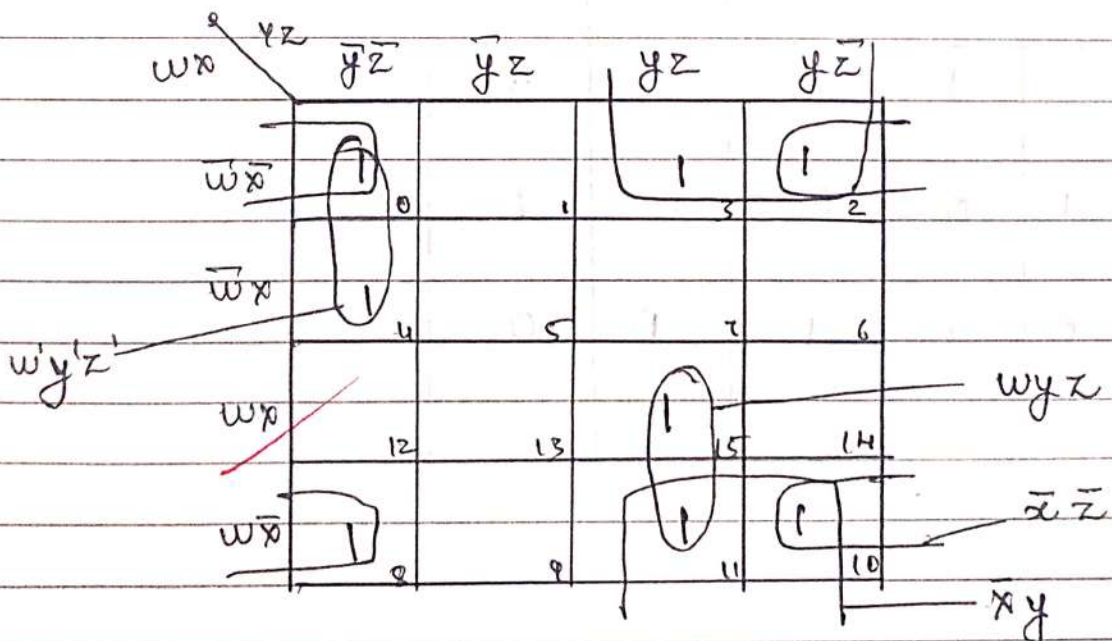
case 1: $\underline{0000} + \underline{1011} + \underline{0000} + \underline{0010}$
 0 11 0 2

case 2: $\underline{1010} + \underline{1111} + \underline{0100} + \underline{0011}$
 10 15 4 11

case 3: $\underline{0000} + \underline{1011} + \underline{0100} + \underline{0010}$
 8 11 4 3

$f(w, x, y, z) = \Sigma (0, 2, 3, 4, 8, 10, 11, 15)$

K-map

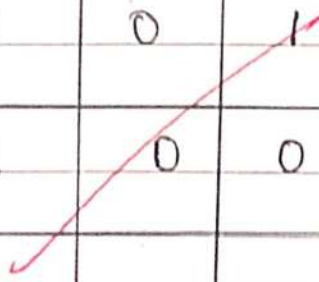


$$f(w, x, y, z) = w'z' + wyz + w'y'z' + x'y$$

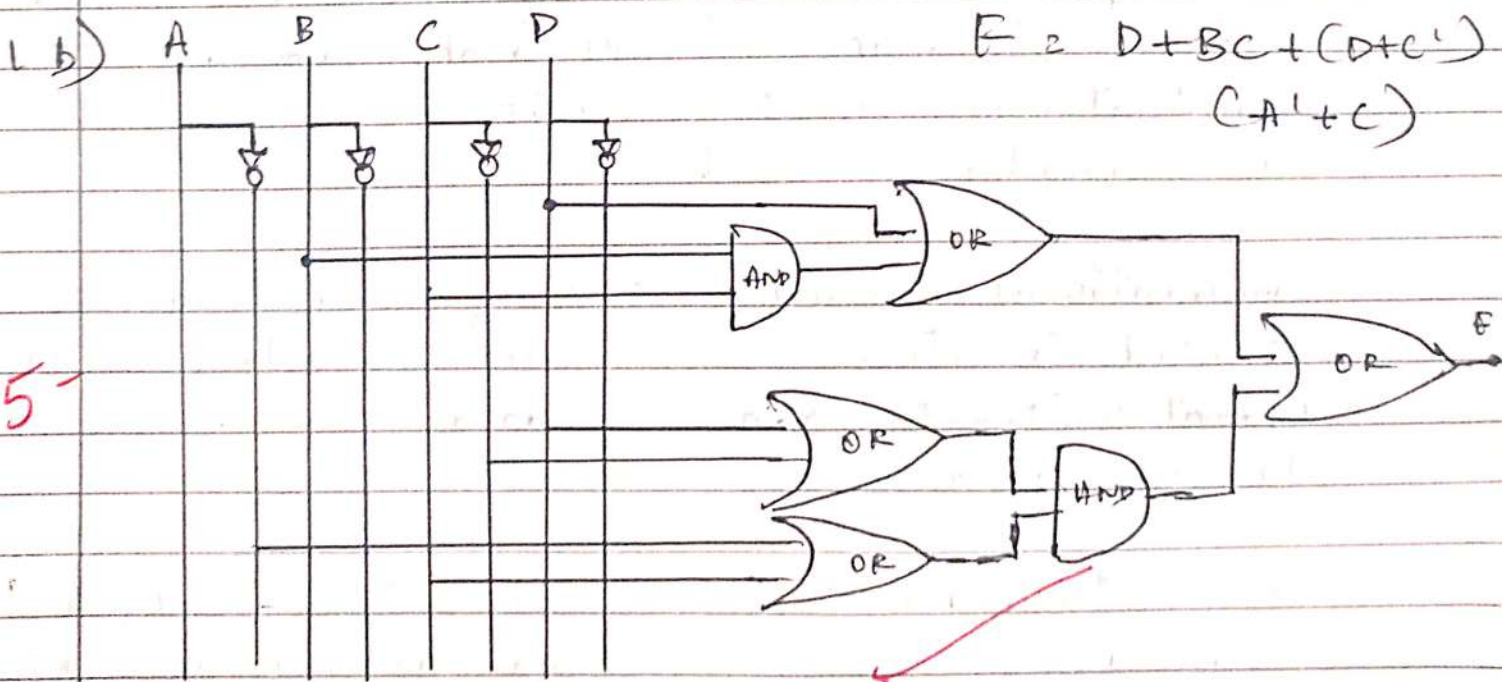
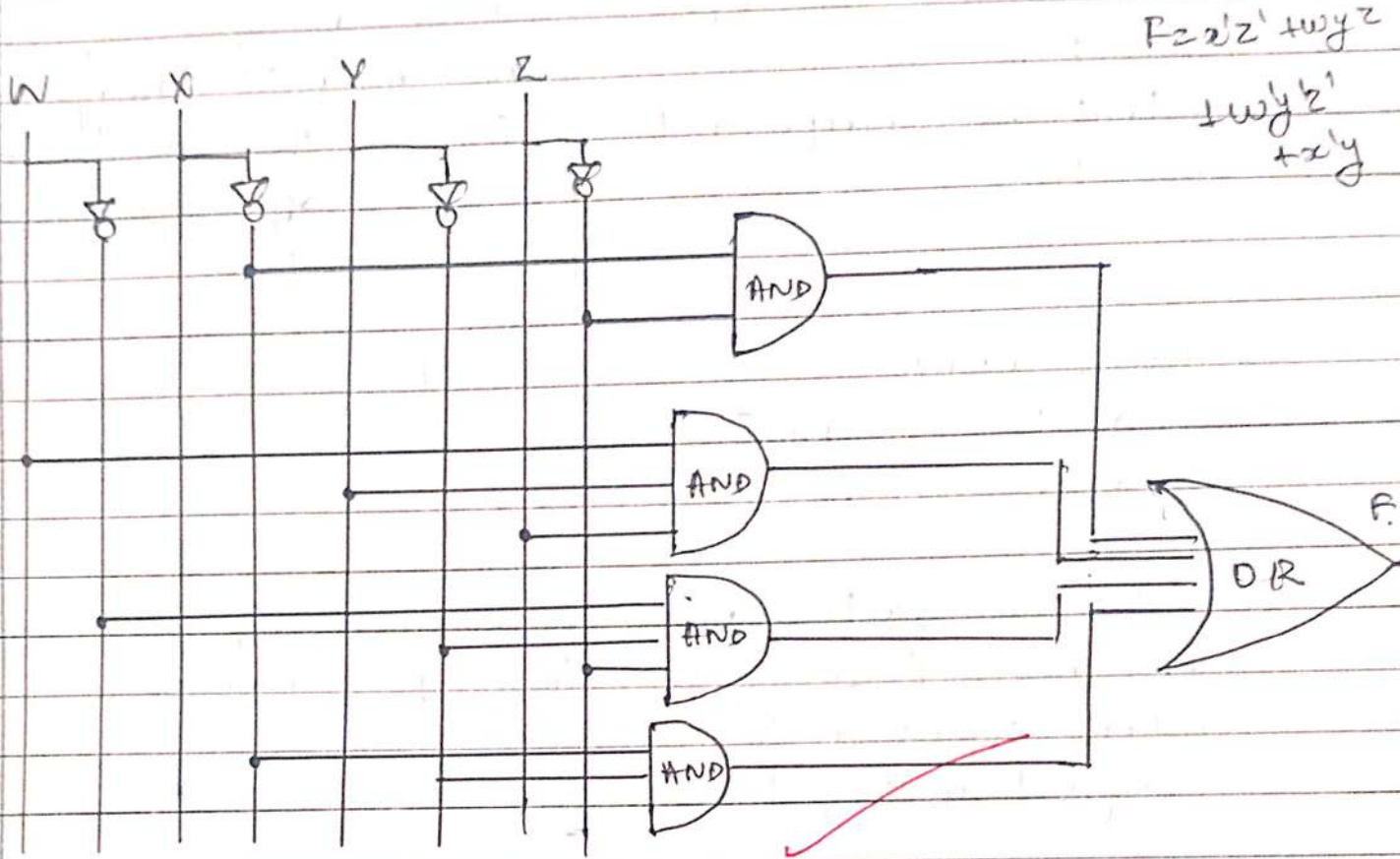
Truth table

w	x	y	z	F
0	0	0	0	1
1	1	1	1	1
0	0	1	1	1
1	1	0	0	0
0	0	0	1	0
0	0	1	0	1
1	1	1	0	0
0	1	1	1	0
1	0	0	0	1
0	1	1	0	0

-08-



Logic Diagram



Combinational circuit

1. It is a type of circuit in which the output is independent of time.
2. No feedback is required for its next generation.
3. It is faster and has high performance when compared to sequential circuit.
4. No implementation of feedback will make combinational circuit less complex.
5. Combinational circuit is used to store ~~output~~ arithmetic and Boolean operation.
6. Elementary blocks are logic gates.

Sequential circuit

1. It is a type of circuit where output always not relies on the current input but also depends on the previous output.
2. Feedback is required for its next generation.
3. Comparatively slower and low performance.
4. Implementation of feedback will make ~~com~~ sequential circuit more complex.
5. Sequential circuit is used to store memory data.
6. Elementary blocks are logic gates as well as flip flops.

Module - 2

3 a) 3:8 line decoder
truth table

I_2	I_1	I_0	D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	1	0
0	1	0	0	0	0	0	0	1	0	0
0	1	1	0	0	0	0	1	0	0	0
1	0	0	0	0	0	1	0	0	0	0
1	0	1	0	0	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0

The 3:8 line decoder represented it has 3 inputs and 8 outputs in which each has one minterm of 3 input variable.

The main application of this decoder is to convert binary to octal.

Minterms can be expanded using inputs.

$$D_0 = \bar{I}_2 \bar{I}_1 \bar{I}_0$$

$$D_1 = \bar{I}_2 \bar{I}_1 I_0$$

$$D_2 = \bar{I}_2 I_1 \bar{I}_0$$

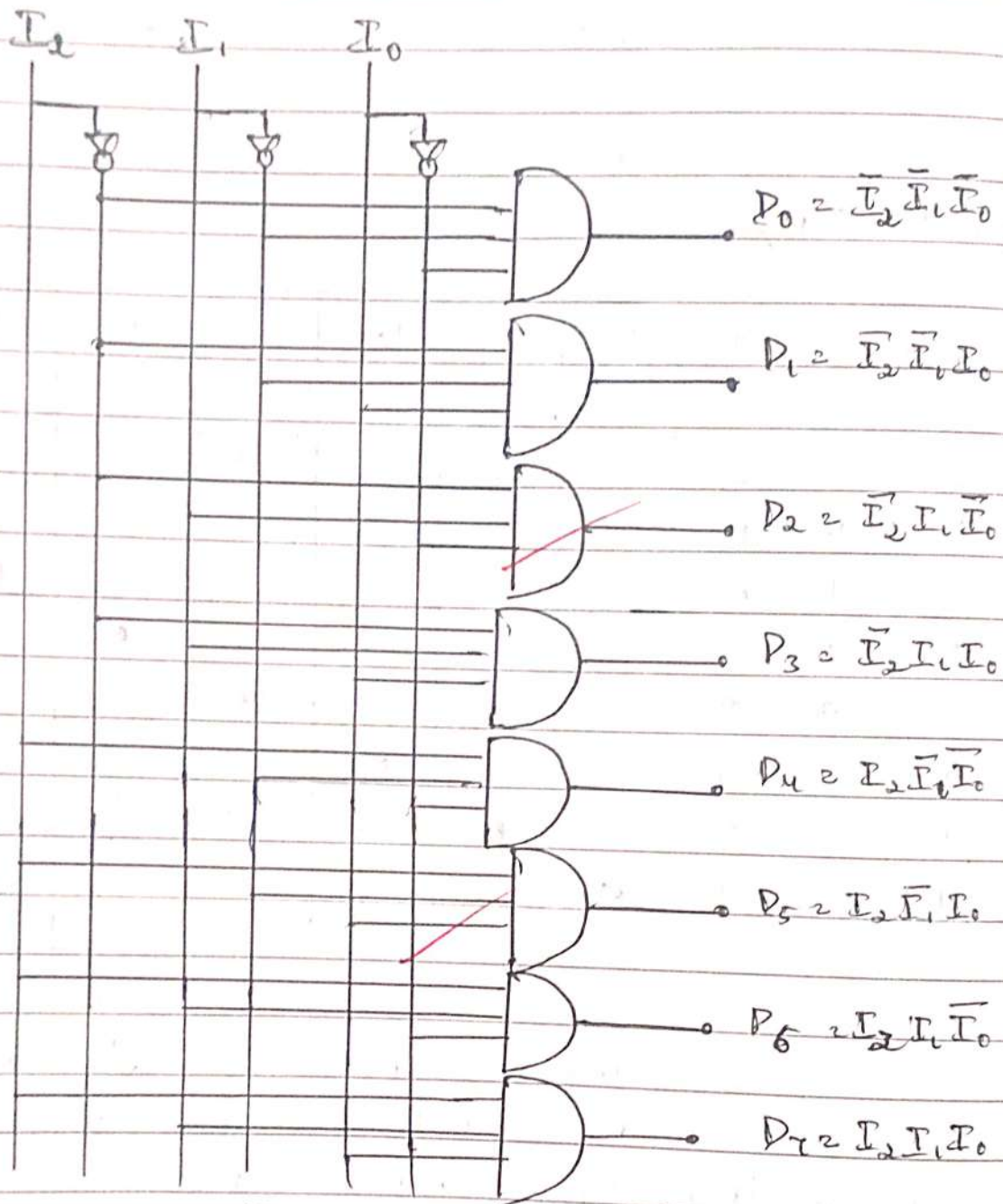
$$D_3 = \bar{I}_2 I_1 I_0$$

$$D_4 = I_2 \bar{I}_1 \bar{I}_0$$

$$D_5 = I_2 \bar{I}_1 I_0$$

$$D_6 = I_2 I_1 \bar{I}_0$$

$$D_7 = I_2 I_1 I_0$$



3:8 line decoder

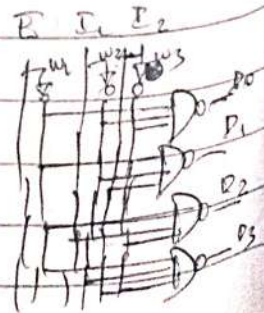
Verilog code for 2:4 line decoder

```

module ab(I1, I2, E, D);
output D[0:3];
input I1, I2;
input E;
wire w1, w2, w3;
not G1(w1, E);

```

E	I1	I2	D0	D1	D2	D3
0	0	0	0	0	0	0
0	0	1	0	0	0	1
0	1	0	0	1	0	0
0	1	1	0	0	1	1

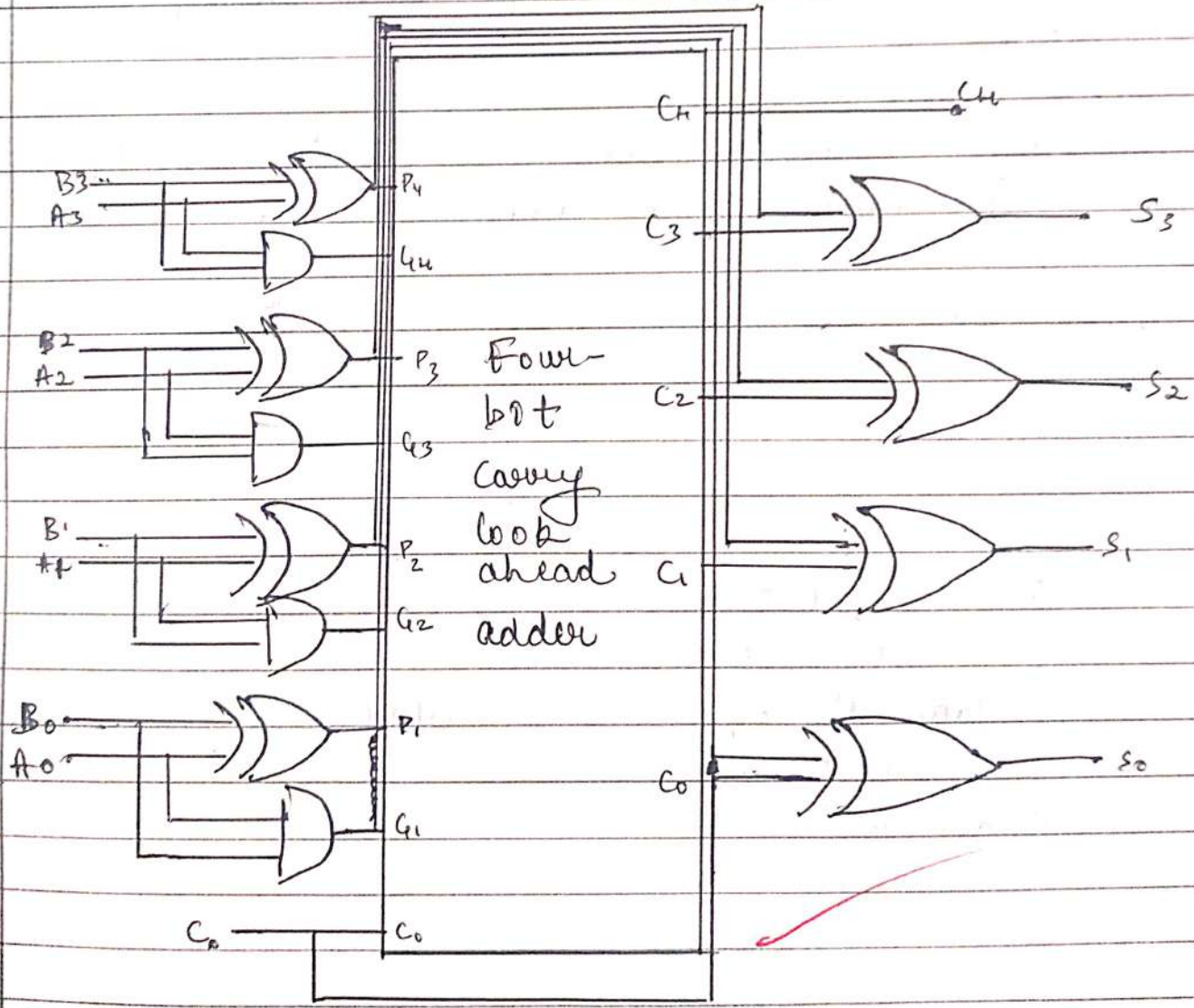


```

not G2 (w2, I1);
not G3 (w3, I2);
nand G4 (D[0], w1, w2, w3);
nand G5 (D[1], w1, w2, I2);
nand G6 (D[2], w1, I1, w3);
nand G7 (D[3], w1, I1, I2);
end module

```

3 b) Four-bit carry lookahead adder



- Carrylook ahead adder is a type of adder in which it will be used to perform faster arithmetic operations to generate the carry bit beside on the input bits.
- Carrylook ahead adder uses two functions called carry generator & carry propagate to determine the carry output from each stage by not wasting time for previous stage.
- Carrylook ahead adder is constructed by using full-adders and additional logic gates.

Ex.

$$\begin{array}{r} 8 \\ - 3 \\ \hline 5 \end{array}$$

-09-

$$\begin{array}{r} 1000 \\ 0011 \\ \hline 1011 \end{array}$$

8 = 1000

3 = 0011

Take 1's of 3

0101 = 5

1100

Add to 8

1000

1100

10100

→ +1

0101

Expansion

$$C_0 = \text{Carry Generator}$$

$$C_1 = C_0 + P_0 C_0$$

$$C_2 = C_1 + P_1 C_1$$

$$C_2 = C_1 + P_1 C_0 + P_1 P_0 C_0$$

$$C_3 = C_2 + P_2 C_2$$

$$C_3 = C_2 + P_2 P_1 C_0 + P_2 P_1 P_0 C_0$$

$$\frac{37}{40}$$



28.02.24

IA-2 Module-3

Q.

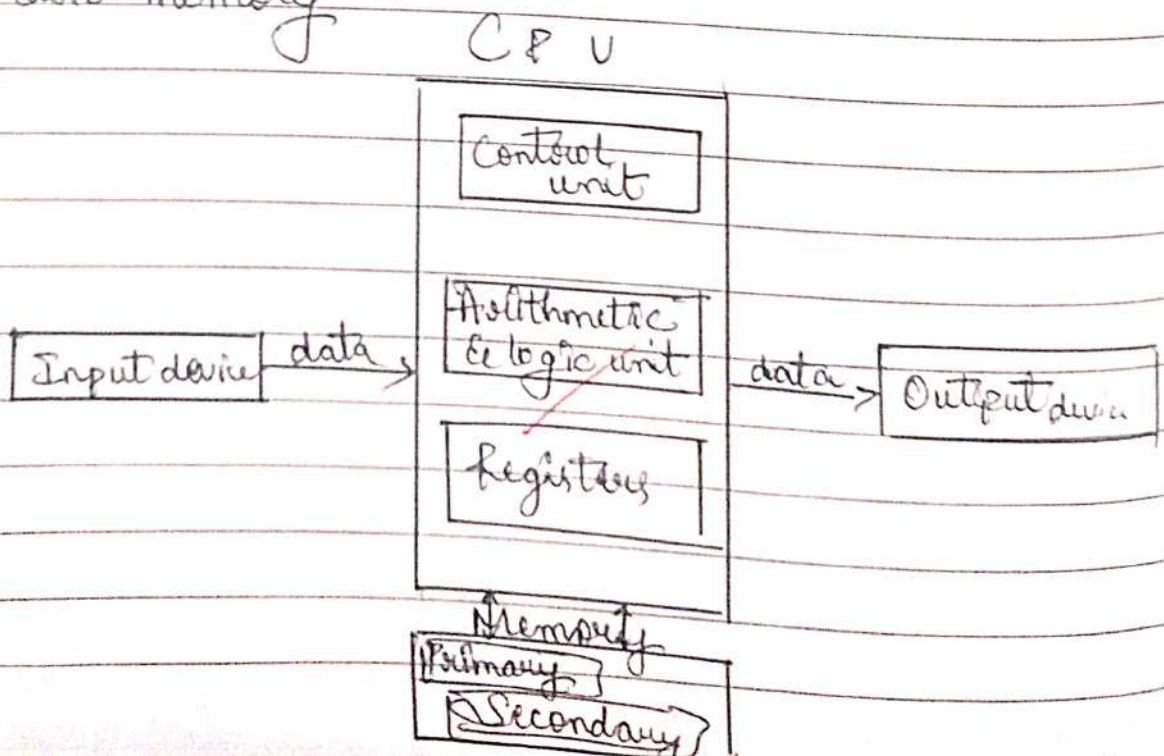
1 a) Computer is an electronic device used to store and give raw data or information and perform hardware and software instructions through the CPU.

Hardware is the output device i.e. ~~to~~ Monitor, printer, speaker etc.

Software is the data given by user to computer to do some activity which will run in the internal part of a computer. Ex: keyboard, mouse etc.

Basic operations of computer

1. Input device
2. Output device
3. Central processing unit
4. Main memory



1) Input device

It is a device in which the data will be sent by the user to computer in high level language. and it will be converted i.e. user understandable language.

Ex: Keyboard, mouse etc

2) Output device

It is a device in which the data will be received from the computer through messages, voice signal, text, pdf, document etc. And the output is received to the user through these type of signals.

Ex: Printer, Monitor, Speakers etc.

3) Central processing unit :-

It is also known as the brain of the computer. It coordinates all the activity of the computer.

The data which is sent by the input device is converted to machine level language & the output which will be sent to the output device is converted to high level language.

1) Control unit :- It controls and coordinates overall activity of the computer.

2) Arithmetic & logic unit :- Arithmetic function & problems will be done.

3) Register :- It is temporary memory & a faster memory.

Main Memory :- Basically it is used to store information.

Primary Memory :- It is nothing but RAM. It is a temporary memory used to store memory for shorter period of time.
Ex, DRAM, SDRAM etc.

Secondary Memory :- It is a permanent memory & it is volatile. It will be stored for life long. It will be deleted only when you delete the memory. Ex, ROM, Floppy disk, pen drive etc.

Module-4 Questions

3 a) i) Processor clock

The processor clock is used to check whether the instruction given in the clock is correct. The IC technology will also be present here in which all the aspects will be dependent on that.

The clock rate or processor clock, R will be increased only when clock period p is reduced or decreased.

ii) Clock rate :-

The two ways for increasing the clock rate R is

i) Improve the Integrated circuit (IC) technology and the logic circuit will become faster,

As the circuit becomes faster, the clock period P time will be reduced and clock rate R will be increased.

ii) When the processing is done automatically the clock period P time will be reduced then clock rate R will be increased.

The main parameter of clock rate is improve in integrated circuit will change all the aspects of the clock rate.

The time T will be increased as clock rate R is increased with N & S should be reduced.

iii) Basic performance equation

We can focus our attention on the processor time through elapsed time.

-10- Let T be the processor time executed by the program made with high level language.

The machine language object program corresponds to source program. The complete execution of N machine level instruction.

The average of basic steps needed to complete one cycle is S . And clock ^{per} size R .

$$T = \frac{N \times S}{R}$$

If we want ~~the~~ high performance we should follow the steps.

$$T = \frac{N \times S}{R}$$

- i) The value of N should be reduced, the source code to fewer machine instructions.
 - ii) The value of S should be reduced, the basic needed steps should be increased.
 - iii) R should be increased when the frequency is increased.
- N, S, R are not independent variable.

iv) Performance measurement

- It is important to be able to access the performance of computer. Computer designers use the performance measurement to add new features.
- The only parameter that describes the performance of a computer is executing time. The parameters clock speed & various architectural features will be used for performance measurement.
- A non-profit function System Performance Evaluation Corporation (SPEC) is selected & ^{separate} ~~added~~ application together to domain application.

$$\text{SPEC Rating} = \frac{\text{Running time on reference computer}}{\text{Running time on computer under test}}$$

If SPEC is 50 means that is 50 times as faster than SPAR10.

$$\text{SPEC Rating} = \left(\prod_{i=1}^n \text{SPEC}_i \right)^{1/n}$$

b) Memory mapped I/O

I/O mapped I/O

1. Processor may have more address lines in the I/O operation.

1. Processor have less address lines when compared to memory mapped I/O.

2. Decoding is more in Memory mapped I/O

2. Decoding is less in I/O mapped I/O

3. Memory signals control the read and write operation in I/O

3. I/O signals control the read and write operation in I/O.

4. Memory mapped I/O is less efficient.

4. I/O mapped I/O is more efficient.

5. Decoding is expensive in memory mapped I/O

5. Decoding is less expensive or cheaper in I/O mapped I/O

6. Decoding is more complex in memory mapped I/O

6. Decoding is less complex in I/O mapped I/O.

7. More gates ~~adds~~ more delay, it is slower

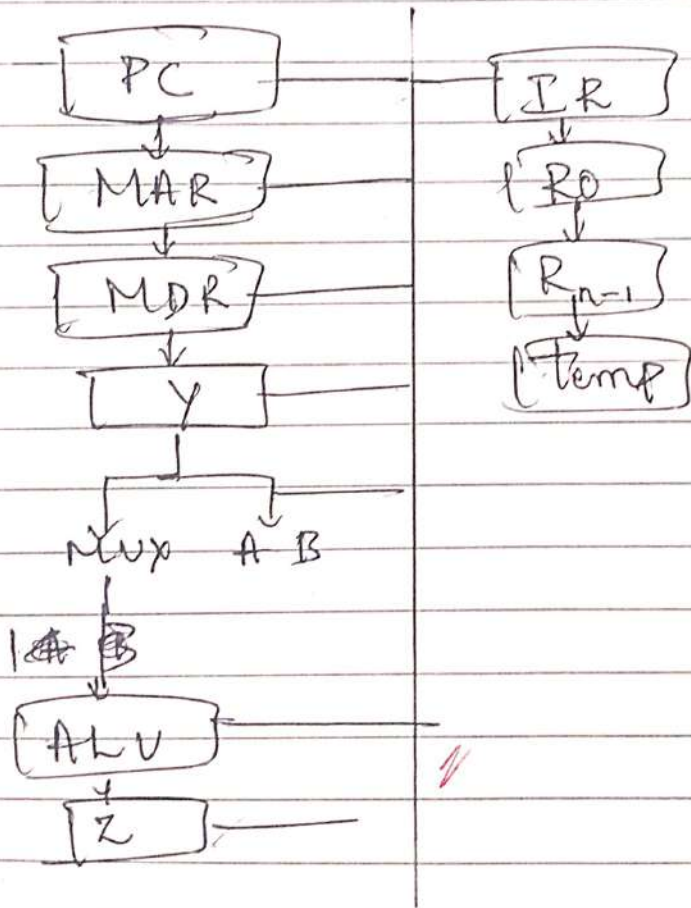
7. It is faster due to less delay.

8. Memory mapped I/O can now be accessed directly through processor.

8. I/O mapped I/O uses IN & OUT to access information

Module - 3

1 b) Single bus architecture



The control sequence for execution of an instruction for ADD (R3), R1

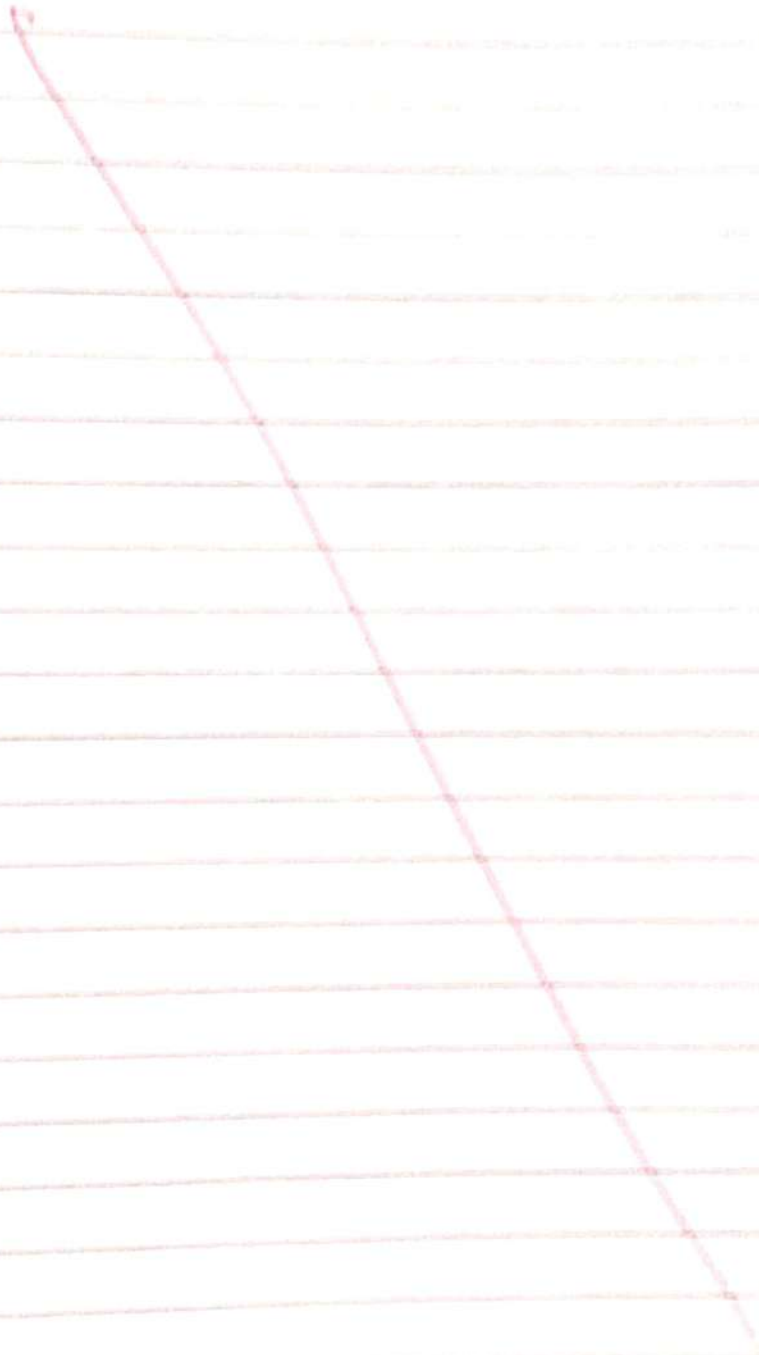
register R1
register R3
Add R1

Add R_2

Add $(R_2)R_1$

$\frac{39}{110}$

\downarrow





DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalagodu, Mysore Road, Bengaluru – 560074

Department of Computer Science & Engineering

ASSIGNMENT QUESTIONS-2

Academic Year:-2023-2024 (Odd sem)

Course Name:- Digital design & Computer Organization

Course Code: BCS302

Date of Given:- 21-02-2024

Semester : 3rd

Date of Submission:- 27-02-2024

Max.Marks:-10



Q No	Questions	CO	RBTL
1	Describe 4 types of addressing modes with examples.	3	2
2	Explain the performance measure of a computer.	3	2
3	Analyze Big endian and Little endian method of byte addressing with proper examples.	3	2
4	Bring out the significance of : i)Basic Performance Equation ii) Clock Rate .	3	2
5	Explain SPEC rating of computer.	3	2
6	Bring comparison between Centralized and Distributed arbitration methods with neat diagrams.	4	2
7	Describe the concept of Interrupt in computer.	4	2
8	Explain the Direct Memory Access Technique and its importance.	4	2
9	Explain the working of single bus organization of computer and fundamental concepts.	4	2
10	State the steps required in execution of Add(R ₃),R ₁ and explain the execution of branch instruction.	4	2,3
11	List the difference between Memory mapped I/O and I/O mapped I/O.	4	1
12	Explain basic idea of pipelining and 4-stage pipeline structure	5	2

Course Outcome:-

- CO3: Describe the fundamentals of machine instructions, addressing modes and Processor performance.
- CO4: Explain the approaches involved in achieving communication between processor and I/O devices.
- CO5: Analyze internal Organization of Memory and impact of Cache/Pipelining on Processor Performance

Name & Signature of the Course Instructor

CHAMPA. CH (Champa. CH)

HOD Signature



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Department of Computer Science & Engineering
Internal Assessment Test-II

Course Name: Digital design & Computer Organization
 Date: 28/2/2024

Course Code: BCS302

Semester & Section: III-A, B, C

Max marks: 40

Time: 3-4.15PM

*Note: Answer any Two full questions, choosing only One full question from each Module.
 Each full question carry maximum of 20 marks*

Course Outcome

Q NO	Module-3 Questions	MARKS	CO	RBTL
1.	a) Explain the basic operation concepts of the computer with neat diagram.	10 M	CO3	L2
	b) Draw the single bus architecture and explain the control sequence for execution of instruction ADD (R ₃),R ₁ .	10M	CO3	L1,L2
OR				
2.	a) Explain one address, two address and three address instruction with examples. Also use any of these instructions to carry out C←[A]+[B].	10M	CO3	L2,L3
	b) Define Addressing mode. Explain the various Addressing mode.	10M	CO3	L1,L2
Module-4 Questions				
3.	a) Explain the following : i) Processor clock ii) Clock rate iii) Basic performance equation iv) Performance measurement.	10M	CO4	L2
	b) Differentiate between Memory mapped I/O and I/O mapped I/O.	10 M	CO4	L1
OR				
4.	a) Explain the Direct memory access technique and its importance.	10M	CO4	L2,L3
	b) Explain Interrupt nesting and handling simultaneous requests in Interrupts.	10 M	CO4	L2,L3

- CO3: Describe the fundamentals of machine instructions, addressing modes and Processor performance.
- CO4: Explain the approaches involved in achieving communication between processor und I/O devices.

CHAMPA.C.H Champa.CH
 Name & Signature of Course Instructor –

[Signature]
 Scrutinized by (Name & Signature)

[Signature]
 HOD



Don Bosco Institute of Technology, Bangalore
 Kumbalagodu, Mysore Road, Bangalore 74
 Department of Computer Science and Engineering
 Internal Assessment Test - 2
 SCHEME OF EVALUATION



Name of the Course: DDCO
 Faculty Name: Champa C.H.

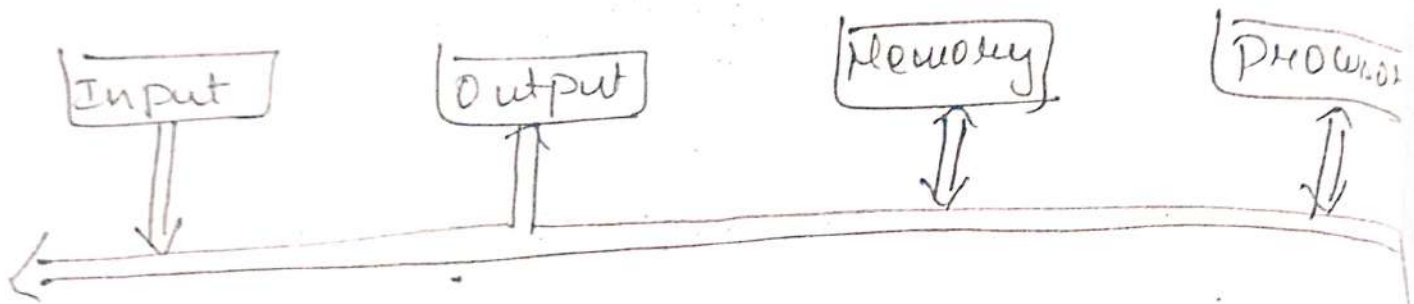
Course Code: BCS 302
 Date: 28/2/2024

Semester: III
 Max Marks: 40

Q.No	SCHEME & SOLUTION	Marks
1) a)	Module-3	
	Basic Operation concepts of the computer:	-10M
	Sol:-	
		-5M-
	Explanation of Each blocks:-	
	→ Input & Output device.	
	→ Memory.	-5M-
	→ Processor (Arithmetic & Logic)	
	* Control unit	

2) Single bus architecture, control
 Execution of instruction ADD (R3), R1

⇒ Single bus structure:



Explanation about single bus

Add (R3), R1

- Fetch the instruction
- Fetch the first operand
- Perform the addition.
- Load the result into R1

Control sequence:

Step	Action
1	PCout, MARin, Read, Select A, Add, Zin
2	Zout, PCin, Yin, WMFC
3	MDRout, IRin
4	R3out, MARin, Read
5	R1out, Yin, WMFC
6	MDRout, Select Y, Add, Zin
7	Zout, R1in, End

No	SCHEME	Marks
----	--------	-------

OR

2(a) One address, 2 address, 4 3 address instructⁿ with 1000
ex.

Solⁿ:- A processor register usually called the accumulator may be used for unique location.

Th^t is one address instructⁿ:

- 3 -

Ex:
Add A
Load A
Store A

2-Address: Explanation:

Ex:
Load A, R_i
Store R_i, A
Add A, R_i

- 3 -

3-Address: Explanation:

Ex: Add R_i, R_j, R_k

- 4 -

$C \leftarrow [A] + [B]$ can be achieved by:

move A, R _i	move A, R _i
move B, R _j	Add B, R _i
Add R _i , R _j	move R _i , C
move R _j , C	

Ex

Q(b) Addressing Modes:-

Solⁿ:- The different ways in which the location of an operand is specified in an instruction are addressing modes. - 2M-

Different types of AM are:

- Immediate
- Register
- Absolute (Direct)
- Indirect
- Index
 - Base with index
 - Relative
- Auto increment
- Auto decrement

Explanation of AM with examples. - 6M-

Module-1: Question

3) a) i) Processor clock:

Clock defines regular time intervals called clock cycles. To execute a machine instruction, the processor divides the action to be performed into a sequence of basic steps.

Cycles per second is called Hertz.

ii) clock rate:

The inverse of length P of one clock cycle is clock rate.

$$R = \frac{1}{P}$$

iii) Basic performance eqⁿ:

$$T = \frac{N \times S}{R}$$

$T \rightarrow$ Processor Time

$N \rightarrow$ The no of instructions

$S \rightarrow$ Avg no of steps needed to execute 1 machine instruction

$R \rightarrow$ clock rate.

iv) Performance measurement.

The only parameter used is the time T . SPEC is used to measure performance measurement.

$$\text{SPEC rating} = \left(\prod_{i=1}^n \text{SPEC}_i \right)^{1/n}$$

3(b) \Rightarrow Memory mapped I/O & I/O mapped I/O difference.

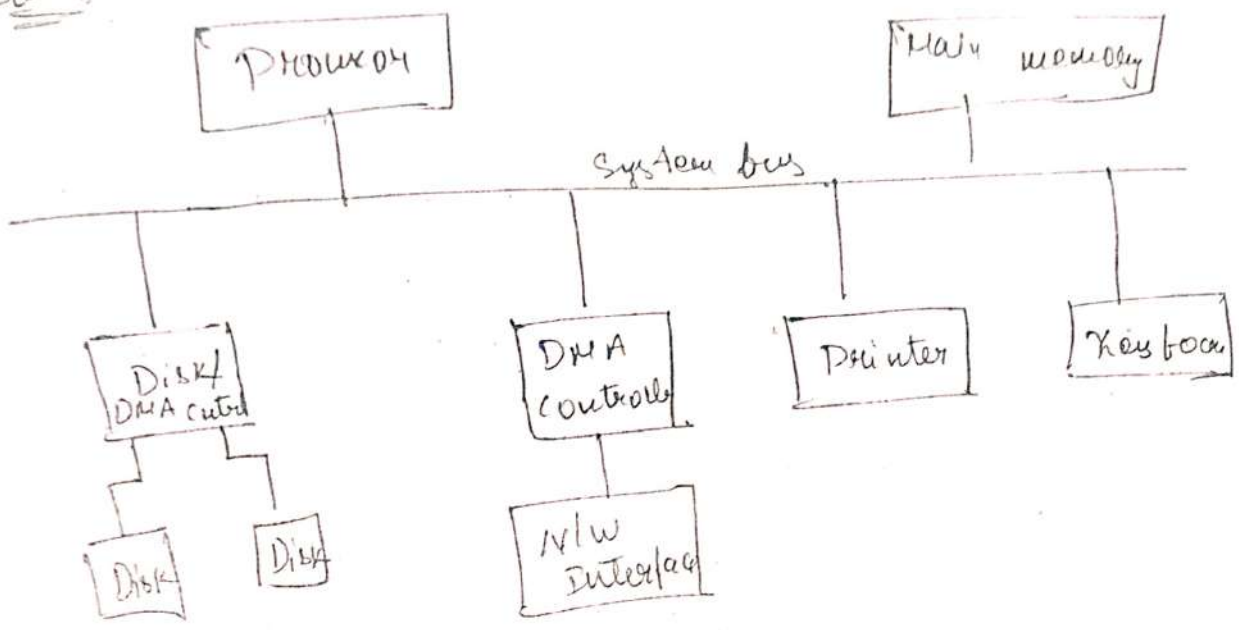
Solⁿ:-

Memory mapped I/O	I/O mapped I/O
\rightarrow Address size :- Assigned with 16-bit address value.	Assigned with 8-bit address value.
\rightarrow Instructions used :- are LDA & STA, etc.	Instr used are IN and OUT.
\rightarrow Registers :- Any register can communicate with I/O	\rightarrow Only accumulator can communicate.
\rightarrow Spou :- 2^{16} I/O ports are used.	Only 256 I/O ports are available.
\rightarrow One set of databuses are reqd.	Separate address & data bus are reqd.

Q7

Q/a) Direct Memory access tech. & its importance - 10M.

⇒ Solⁿ:-



- 5M -

Explanation -

- 2M -

Importance of DMA :-

- 3M -

- * It proceeds independently to implement the specified operation.
- * It incorporate a data storage buffer.

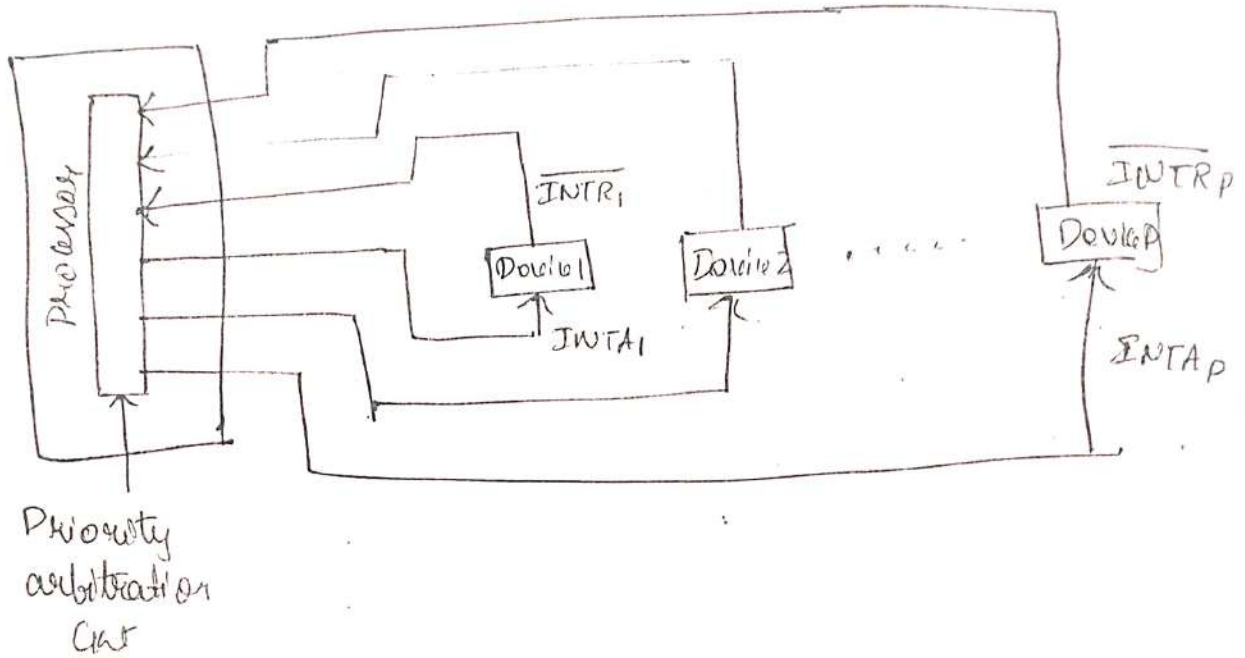
* DMA controller reads & given exclusive access to main memory.

* DMA devices for using the bus are always given high priority.

4(b) Interrupt nesting and Handling simultaneous request in Interrupts. -10M-

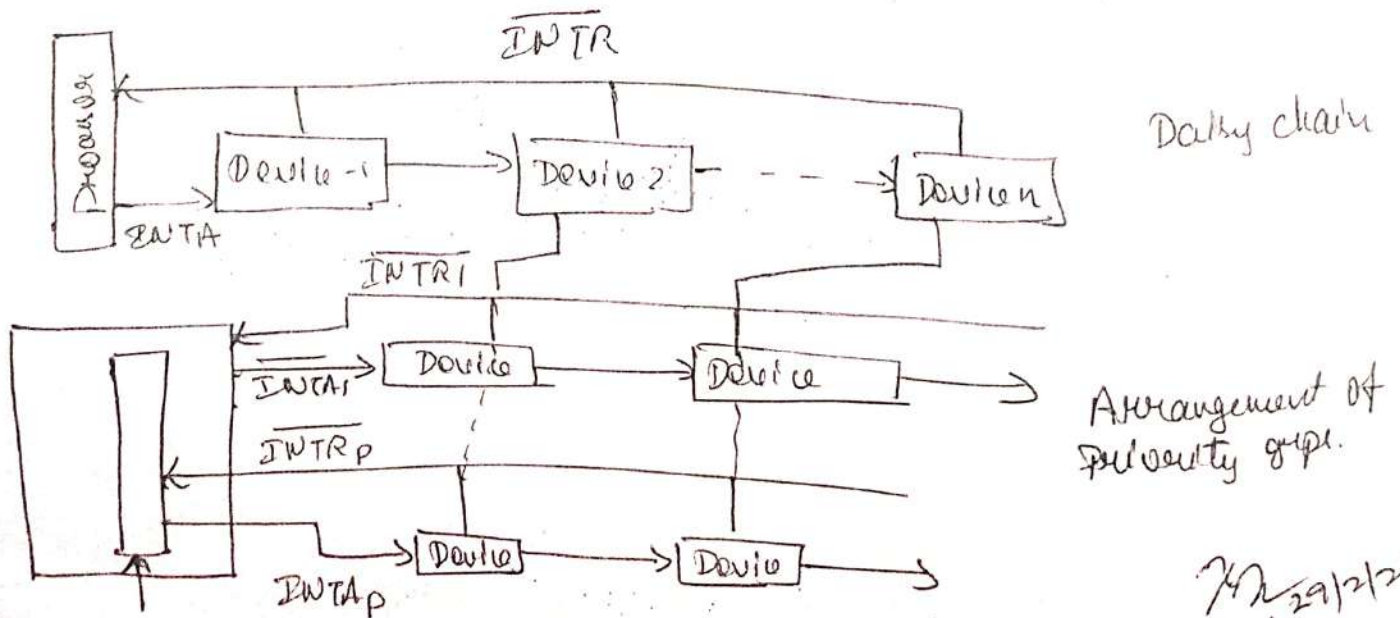
Solⁿ: \Rightarrow Interrupt nesting:

-5M-



An attempt to execute a privileged instruction while in the user mode leads to a special type of interrupt called privilege exception.

Handling simultaneous request in Interrupts: -5M-



M 29/2/21
HOD Signature



Date: 08/01/2024

1st INTERNAL ASSESSMENT TEST TIME -TABLE**ODD SEMESTER –AY-2023-24**

It is to bring to the kind notice of all 3rd semester students that First Internal assessment (IA-1) will start from 11th of January 2024 and the detailed Timetable is as below

III SEM (2022 SCHEME)

DATE/DAY	TIME	SUBJECT CODE
11/01/2024	10:00 am To 11:15 am	BCV301
	3:00 pm To 4:15 pm	BCV302
12/01/2024	10:00 am To 11:15 am	BCV303
	3:00 pm To 4:15 pm	BCV304
13/01/2024	10:00 am To 11:15 am	BCV306C
	3:00 pm To 4:00 pm	BCV358D

Note:

- All two internal assessment tests are compulsory.
- 85% of attendance and submission of assignments is must to attend internal test.
- Wearing ID card is mandatory.
- Smart watches, cell phones are not allowed.


IA-COORDINATOR


HOD

Head of the Department
Department of Civil Engineering
Don Bosco Institute of Technology
Bengaluru - 560 074


PRINCIPAL
PRINCIPAL
Don Bosco Institute of Technology
Kumbalagodu, Mysore Road,
Bengaluru - 560 074



1st Internal Assessment Students Attendance:AY: 2023-24

Room No. B-212

Semester : III

Sl.No.	NAME OF THE STUDENT	USN	11-01-2024		12-01-2024		13-01-2024	
			BCV301	BCV302	BCV303	BCV304	BCV306C	BCV358D
			10:00 am To 11:15 am	3:00 pm To 4:15 pm	10:00 am To 11:15 am	3:00 pm To 4:15 pm	10:00 am To 11:15 am	3:00 pm To 4:00 pm
1	NANDINI R	IDB22CV001	<u>Nandini R</u>	<u>Nandini R</u>	<u>Nandini R</u>	<u>Nandini R</u>	<u>Nandini R</u>	<u>Nandini R</u>
2	NELIAGOU DAR	IDB22CV002	<u>Nela. G</u>	<u>Nela. G</u>	<u>Nela. G</u>	<u>Nela. G</u>	<u>Nela. G</u>	<u>Nela. G</u>
3	PRERANA N	IDB22CV003	<u>Prerona N</u>	<u>Prerona N</u>	<u>Prerona N</u>	<u>Prerona N</u>	<u>Prerona N</u>	<u>Prerona N</u>
4	SRINIDHI S P	IDB22CV004	<u>Srinidhi S P</u>	<u>Srinidhi S P</u>	<u>Srinidhi S P</u>	<u>Srinidhi S P</u>	<u>Srinidhi S P</u>	<u>Srinidhi S P</u>
5	UDAY S J	IDB22CV005	<u>Uday S.J.</u>	<u>Uday S.J.</u>	<u>Uday S.J.</u>	<u>Uday S.J.</u>	<u>Uday S.J.</u>	<u>Uday S.J.</u>
6	venu PRAKASH M B	IDB22CV006	<u>Venuprakash</u>	<u>Venuprakash</u>	<u>Venuprakash</u>	<u>Venuprakash</u>	<u>Venuprakash</u>	<u>Venuprakash</u>
7	ABHISHEK N	DIP	<u>Abhishek N</u>	<u>Abhishek N</u>	<u>Abhishek N</u>	<u>Abhishek N</u>	<u>Abhishek N</u>	<u>Abhishek N</u>
8	BHAVANA M		<u>Bhavana M</u>	<u>Bhavana M</u>	<u>Bhavana M</u>	<u>Bhavana M</u>	<u>Bhavana M</u>	<u>Bhavana M</u>
9	DARSHAN GOV. DA K R		<u>Darshan</u>	<u>Darshan</u>	<u>Darshan</u>	<u>Darshan</u>	<u>Darshan</u>	<u>Darshan</u>
No. of Students Present			09	09	09	09	09	09
No. of Students Absent			00	00	00	00	00	00
Name of the Invigilator			Manjularani P	Sandhya Rani G.M	Manjularani P	Ushinath S	Raghavendra R	Sandhya Rani G.M
Invigilator Signature			<u>Manjularani P</u> 11/3/24	<u>Sandhya Rani G.M</u> 11/3/24	<u>Manjularani P</u> 12/1/24	<u>Ushinath S</u> 12/1/24	<u>Raghavendra R</u> 13/1/24	<u>Sandhya Rani G.M</u> 13/1/24
Name of the Squad Member								
Signature of the Squad Member								

Manjularani P
IAC Coordinator

Sandhya Rani G.M
HOD

USN

1 D B



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Department of Civil Engineering

BSY
10/1/24

Internal Assessment Test-I

ACADEMIC YEAR (2023-2024)

Course Name: Strength of Materials
 Semester: 3rd

Course Code: BCV301
 Max marks: 40

Date: 11/01/2024
 Time: 9.30am to 10.45am

*Note: Answer any Two full questions, choosing only One full question from each Module.
 Each full question carry maximum of 20 marks*

No.	Module-1 Questions	MARKS	CO	RBTL
1.	a) Define the following terms, (i) True stress (ii) Proof stress (iii)Poisson ratio (iv)Modulus of rigidity (v)Youngs modulus	10	1	L1
	b) Derive equation for elongation of a bar of uniform cross section due to self-weight	10	1	L2
OR				
2.	a) With a neat sketch, define salient features of stress-strain curve for a tensile specimen.	10	1	L2
	b) A steel bar ABCD of various segment is subjected to the axial force as shown in figure 1 . find the value of P necessary for equilibrium. If $E = 210 \text{ kN/mm}^2$, determine stress in various segments, total elongation of bar and total stain in bar.	10	1	L2
Module-2 Questions				
3.	a) Explain types of beams and type of supports	10	2	L1
	b) Draw SFD & BMD of the simply supported beam loaded as shown in figure 2	10	2	L2
OR				
4.	a) Derive the relation between load intensity, shear force and bending moment	10	2	L2
	b) Draw the shear force and bending moment diagram for an overhanging beam as shown in figure 3	10	2	L2

Students should be able to:

CO - 1: Evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements.

CO - 2: Analyse different internal forces and stresses induced due to representative loads on structural elements.

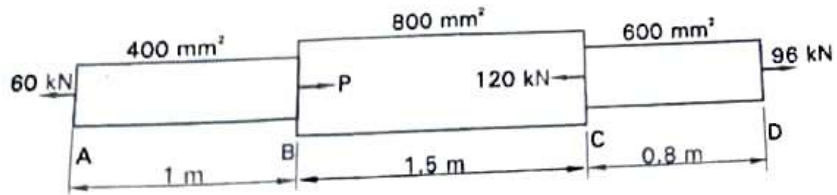


Figure 1

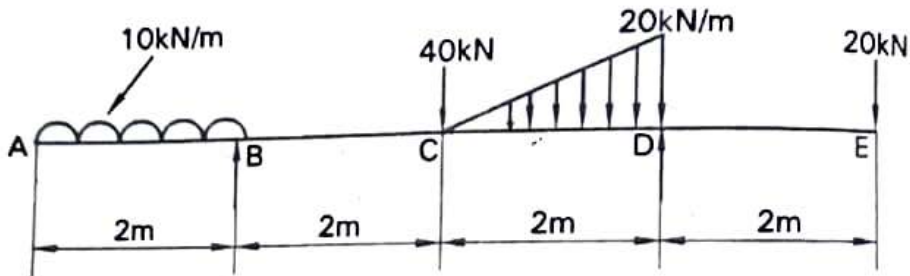


Figure 2

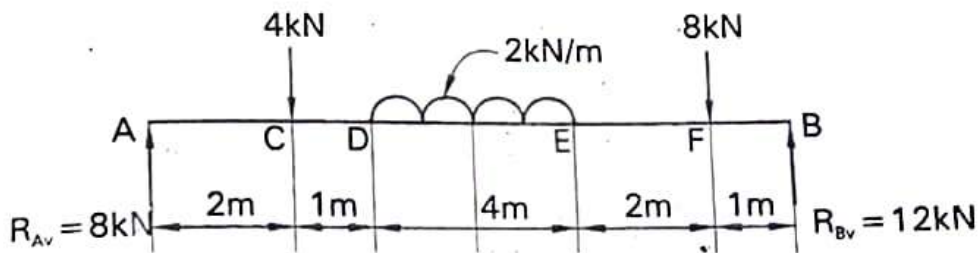


Figure 3

Name & Signature of Course Instructor

Manjularani, P

Scrutinized by (Name & Signature)

1) GOBINATH S

2) Raghavendra, R

HOD signature:



Internal Assessment Test - 1/2/3

SCHEME OF EVALUATION

Name of the Course: Strength of Materials
Max Marks: 40

Course Code: BCV301
Faculty Name: Manjularani, P

Semester: 3rd
Date: 11/01/24

SCHEME & SOLUTION

MARKS

1(a) Definition & explanation

- (i) True stress
- (ii) Poisson stress
- (iii) Poisson ratio
- (iv) Modulus of rigidity
- (v) young's modulus

} each 2 marks

5x2

10M

1(b)

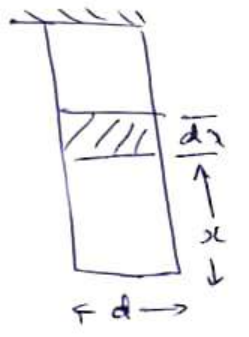
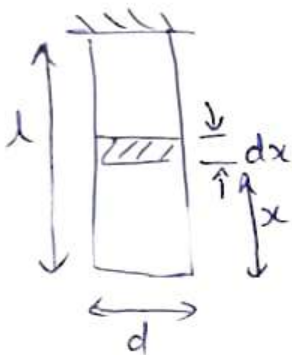


fig with explained

3m-

$$w_x = \text{volume} \times \text{weight density}$$

$$w_x = \text{area} \times \text{length} \times \text{density}$$

$$= A \times \gamma$$

2m-

$$\text{Elongation of elemental length} = \frac{w_x \cdot dx}{A \cdot E} = \frac{A \cdot \gamma \cdot dx}{A \cdot E} = \frac{\gamma \cdot dx}{E}$$

2m-

$$\text{Elongation of bar } \delta L = \int_0^L \frac{\gamma \cdot dx}{E} = \frac{\gamma}{E} \int_0^L x \cdot dx = \frac{\gamma}{E} \left[\frac{x^2}{2} \right]_0^L = \frac{\gamma L^2}{2E}$$

Total weight of the bar, $W = \gamma A L$

$$\therefore \gamma = \frac{W}{AL}$$

3m-

$$\therefore \delta L = \frac{WL^2}{2ALE} = \frac{WL}{2AE} \text{ where } A = \frac{\pi}{4} d^2$$

10M

Q. NO

2(a)

- Proportional limit
- Elastic limit
- Upper yield point
- Lower yield point
- ultimate strength
- Breaking point or Rupture strength

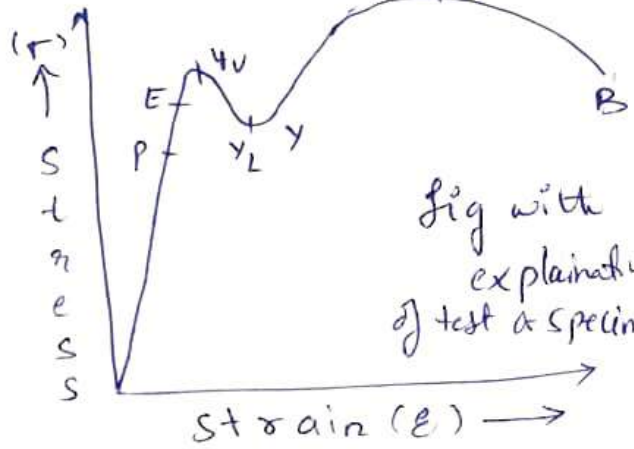
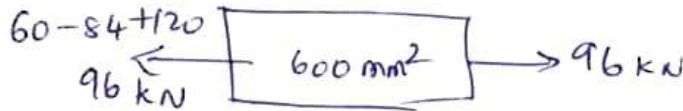
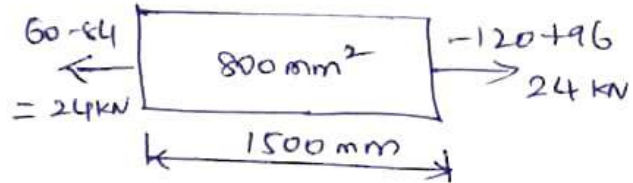
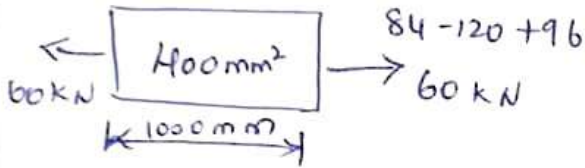


Fig with explanation of test & specimen

2(b)



$$P + 96 = 60 + 120$$

$$P = 84 \text{ kN}$$

(i) Stress in segment $\sigma_1 = \frac{60 \times 10^3}{400} = 150 \text{ N/mm}^2 \text{ (T)}$

$$\sigma_2 = \frac{24 \times 10^3}{800} = 30 \text{ N/mm}^2 \text{ (C)}$$

$$\sigma_3 = \frac{96 \times 10^3}{600} = 160 \text{ N/mm}^2 \text{ (T)}$$

(ii) Elongation of bar

$$\delta L_1 = \frac{PL_1}{AE_1} = \frac{\sigma_1 L_1}{E} = \frac{150 \times 1000}{210 \times 10^3} = 0.7143 \text{ mm}$$

$$\delta L_2 = 0.2143 \text{ mm}$$

$$\delta L_3 = 0.6095 \text{ mm}$$

$$\delta L_{\text{Total}} = 1.1095 \text{ mm}$$

(iii) Total strain in the bar $\epsilon = \epsilon_1 + \epsilon_2 + \epsilon_3 = 1.333 \times 10^{-3}$

3(a) Types of beams

- (i) Simply supported beam
- (ii) Cantilever beam
- (iii) propped cantilever
- (iv) over hanging beam with explanation
- (v) fixed beam

- 5m -

Types of supports

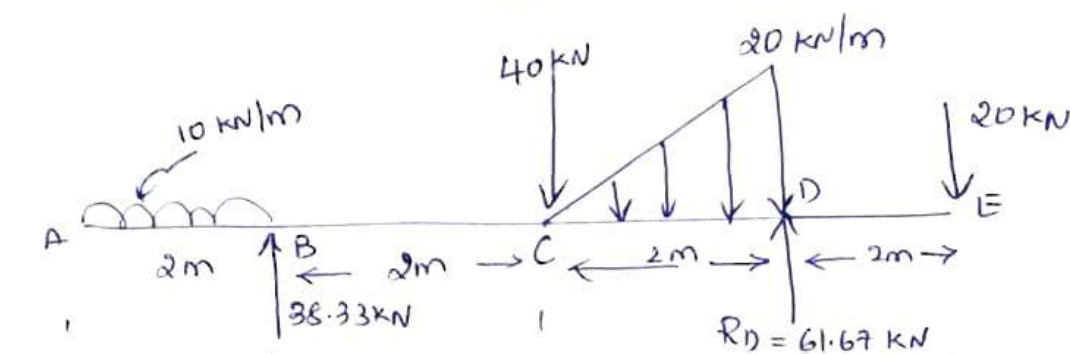
- (i) simply supported
- (ii) hinged or pinned
- (iii) Roller supported
- (iv) Fixed

with explanation

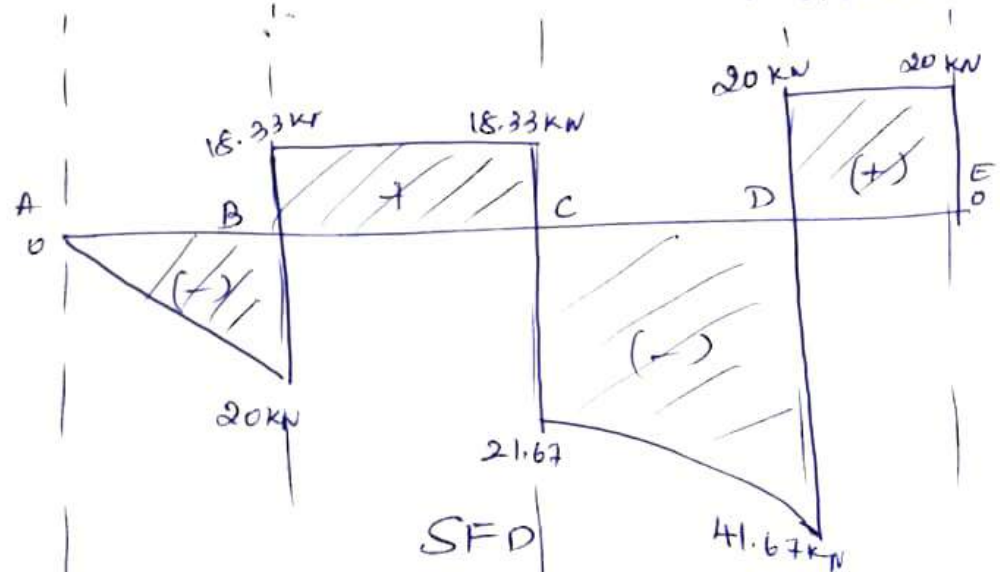
5m

(10M)

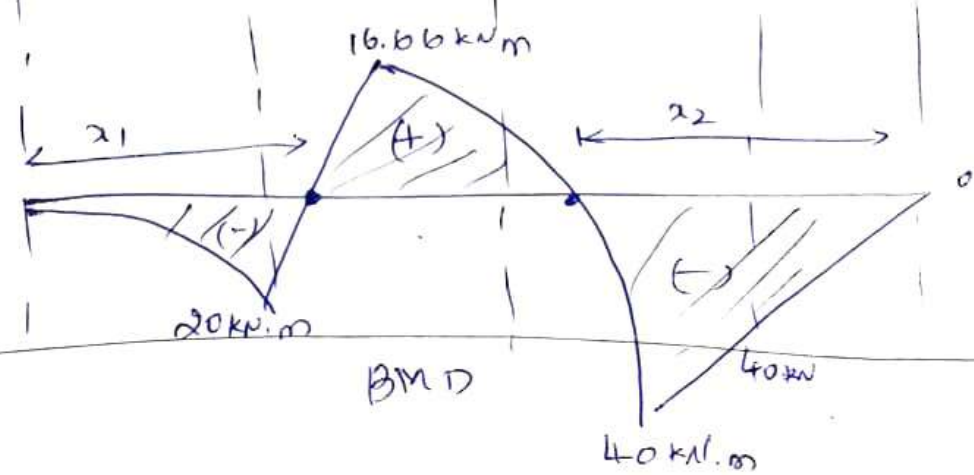
3(b)



$R_B \& R_D = 2m$



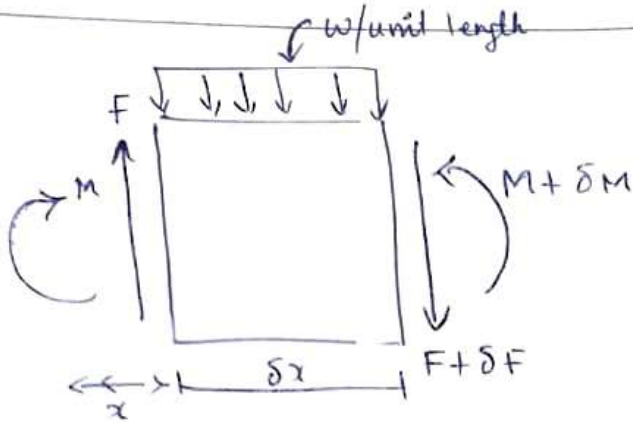
- 4m -



- 4m -

(10M)

4(a)



Explanation with
fig

$\Sigma F = 0$:-
 $F - w\delta x - (F + \delta F) = 0$

$\frac{\delta F}{\delta x} = -w$

$\frac{dF}{dx} = -w$

Bending moment $\Sigma M = 0$:-
 $M + F\delta x - (w\delta x)\left(\frac{\delta x}{2}\right) - (M + \delta M) = 0$

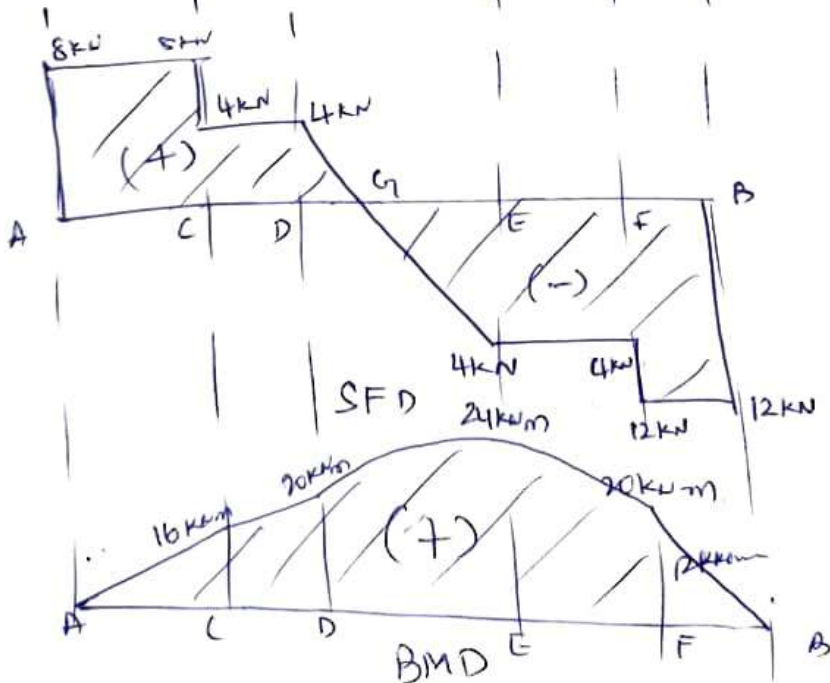
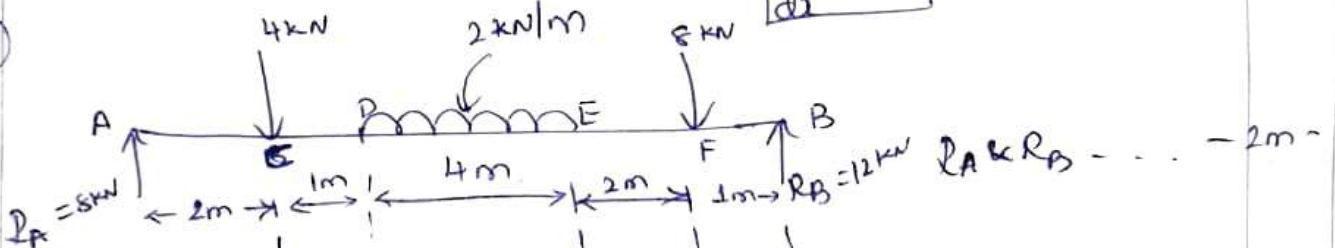
$F\delta x - \delta M = 0$

$\delta M = F \cdot \delta x$

$\frac{dM}{dx} = F$

$\frac{\delta M}{\delta x} = F$

4(b)



Mangulbarani . P
 Faculty Incharge
 10/11/24

10/11/24

HOD

10M



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Department of Civil Engineering

1st Internal Assessment Students Internal Marks AY-2023:2024

Marks :25

SEMESTER:III

Date:11/1/2024 to 13/01/2024

MP GS GMS RR

Sl.No	Name of the Students	USN	BCV301	BCV304	BCV306C	BCV358D
1	NANDINI R	1DB22CV001	21	25	24	19
2	NEHA GOUDAR	1DB22CV002	17	25	24	20
3	PRERANA N	1DB22CV003	6	24	16	19
4	SRINIDHI S P	1DB22CV004	20	25	23	23
5	UDAY S J	1DB22CV005	20	25	24	21
6	VENU PRAKASH M B	1DB22CV006	17	25	20	15
7	ABHISHEK N	1DB23CV400	9	19	8	18
8	BHAVANA M	1DB23CV401	11	13	4	21
9	DARSHAN GOWDA K R	1DB23CV403	13	10	8	19

IA Coordinator

HOD

Department of Civil Engineering
Don Bosco Institute of Technology



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Department of Civil Engineering

ASSIGNMENT-I

Course Name: Strength of Materials
 Semester: 3rd

Course Code: 22CV301

Date of Given: 08/01/2024
 Date of Submission: 18/01/2024

SL.NO	QUESTIONS	MODULE 1 & 2	CO	RBTL
1	With a neat sketch, define salient features of stress-strain curve for a tensile specimen.		CO1	L2
2	Define the following terms, (i) True stress (ii) Proof stress (iii)Poisson ratio (iv)Modulus of rigidity (v)Youngs modulus		CO1	L1
3	Explain temperature stresses induced in a body and derive an expression to find the same.		CO1	L1
4	An axial pull of 40,000N is acting on a bar consisting of three sections of length 300mm,250mm and 200mm and of diameters 20mm,40mm and 50mm respectively. If the Youngs modulus= $2 \times 10^5 \text{ N/mm}^2$, determine (i) Stress in each section (ii) total extension of the bar		CO1	L2
5	A Steel bar 300mm long,50mm wide and 40mm thick is subjected to a pull of 300KN in the direction of its length. Determine the change in volume. Take $E= 2 \times 10^5 \text{ N/mm}^2$ and Poisson's ratio = 0.25		CO1	L2
6	Derive the relation between load intensity, shear force and bending moment		CO2	L2
7	Explain –Sagging bending moment, Hogging bending moment, Point of contra flexure.		CO2	L1
8	Explain types of beams, supports and load with neat sketch		CO2	L2
9	Sketch SFD & BMD for the beam shown in figure. Indicating salient values point of contra flexure, max, -ve and max, +ve BMS & max, SF.		CO2	L2
10	Sketch SFD & BMD for the beam shown in figure. Calculating the salient points including point of contraflexure		CO2	L2

Students will be able to,

CO1- Evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements.

CO2 - Analyse different internal forces and stresses induced due to representative loads on structural elements.

MF
 Course Instructor

[Signature]
 HOD



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Department of Civil Engineering



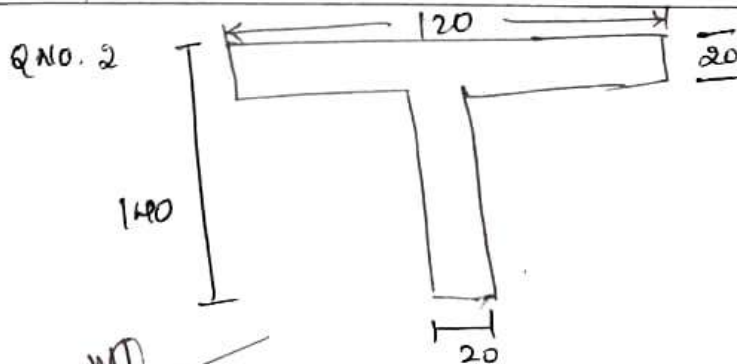
ASSIGNMENT-II

Course Name: Strength of Materials

Course Code: BCV3001
Semester: III SEM

Date of Given: 026/02/24
Date of Submission: 11/03/24

Q. No.	Questions	CO	RBTL
MODULE 3			
1.	With Usual Notation Derive Bending Equation $M/I = E/R = f/y$	03	L2
2.	The T section shown in figure below is used as a simply supported beam over a span of 4m. It carries a uniformly distributed load of 8kN/m over its entire span. Calculate the maximum tensile and compressive stresses occurring in the section.	03	L2
3.	With Usual Notation Derive Torsion Equation $T/J = C0/L = q/R$	03	L2
4.	Determine the diameter of the solid shaft which will transmit 440kW AT 280rpm, if maximum torsional stress is limited to 40N/mm ² . Assume G or C = 84N/mm ²	0	L3
MODULE 4			
1.	Differentiate Column and Strut. List Assumptions of Euler's Column Theory	04	L2
2.	Derive an expression for Euler's crippling load for a column when both of its ends are hinged	04	L2
3.	Find the Euler's crippling load for a hollow cylindrical steel column of 40mm external diameter and 4mm thick. The length of column is 2.5m and is hinged at both ends. also compute the Rankine's Crippling load using Constants 335MPa and 1/7500. Take E = 205 GPa	04	L3
4.	A solid round bar of 60mm diameter and 2.5m length is used as a strut. Find the safe compressive load for the strut if i. both the ends are hinged ii. Bothe ends are fixed. Take E = 2X10 ⁵ N/mm ² and factor of safety = 3	04	L3



[Signature]
Course Coordinator
26/2/24

[Signature]
HOD



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Vision

To be a center of excellence to transform young minds in technical and management education fostering innovation and entrepreneurial skills with ethical, environmental and social responsibility.

Mission

- M1: To impart quality education in order to meet the needs of industry and society.
- M2: To collaborate with academia, industry and research institutes to strengthen teaching and learning process.
- M3: To promote equitable and harmonious development of students to work in teams.
- M4: To imbibe lifelong learning skills and entrepreneurial skills exhibiting leadership.

BLUE BOOK

Perfection of Excellence

Name of the student Neha Goudar

USN: IDB22CV002 Sl. No _____ (For First Semester students only)

Program B.E in Civil engineering Semester 2nd Section _____

Name of the Course Strength of materials Course Code BCV301

Test No	Date	Maximum Marks	Marks Obtained	Signature of the Invigilator	Signature of the Course instructor
1	11/01/24	25	14		
2	28/2/24	25	22		
3					
4					
IA Marks (Average/Total)		25	20		
Assignment					
Quiz / Seminar / GD		25	25		
IPCC / Lab IA					
Total Marks					
Final CIE (Scale Down)		50	45		

Neha. G
Signature of the student

Signature of the course instructor

Declaration by the Student:

- I know that I am not allowed to borrow any instruments/calculator/pen/pencil eraser/sharpener etc... From anybody in the test hall.
- I will not be indulging in any Malpractice / Violation of instruction by the Room Invigilator.
- In case of violation, I may be sent out of the Test & I may not be allowed to attend classes any more till I get my parents (no matter whether they stay in India or abroad) / I may be given T.C.
- For the period I am not allowed to classes. I know I will be losing the Attendance.
- Mobile phones are not allowed inside the examination hall

Signature of the Student

I Test	Q. No	1	2	3	4	5	6	7	8	Total
	a	10		10						
	b			7						
	C									
	Total	10		17						27/40
Signature of the Faculty : <i>[Signature]</i> 12/1/24										

II Test	Q. No	1	2	3	4	5	6	7	8	Total
	a		7		9					
	b		4+4		10					
	C									
	Total		15		19					
Signature of the Faculty : <i>[Signature]</i> 11/3/24										

III Test	Q. No	1	2	3	4	5	6	7	8	Total
	a									
	b									
	C									
	Total									
Signature of the Faculty :										

IV Test	Q. No	1	2	3	4	5	6	7	8	Total
	a									
	b									
	C									
	Total									
Signature of the Faculty :										

11/1/24

Internal Assessment Test-1

(a) (1) True stress :-

True stress is defined as the ratio of Applied load to the unit cross sectional area.

$$\sigma = \frac{P}{A} \quad \text{N/mm}^2$$

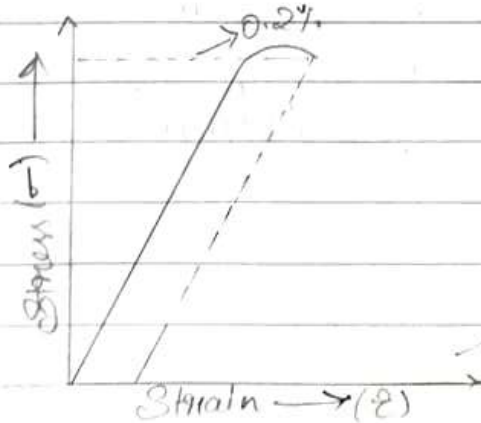
σ → Stress

P → Applied load.

A → Cross sectional area.

(2) Proof stress :-

It is obtained by drawing a line parallel to the linear portion of stress-strain diagram at the distance of 0.2%.



(3) Poisson ratio :-

It is defined as the ratio of Lateral stress to the longitudinal stress.

$$G \text{ (or) } C = \frac{\text{Lateral stress}}{\text{Longitudinal stress}}$$

It is unit less.

(4) Modulus of rigidity :-

It is defined as the ratio of Shear stress to the shear strain.

$$= \frac{\text{Shear stress}}{\text{Shear strain}} \quad \underline{\underline{N/mm^2}}$$

(5) Young's modulus :-

Young's modulus or modulus of elasticity is defined as the ratio of

$$E = \frac{\text{Lateral Stress}}{\text{Linear strain}} \quad \underline{\underline{N/mm^2}}$$

$$E = \frac{\sigma}{\epsilon} \quad \underline{\underline{N/mm^2}}$$

Module - 2

③ a. Types of beams:

- ① Simply supported beam
- ② Cantilever beam
- ③ propped cantilever beam
- ④ Continuous beam.
- ⑤ Over hanging beam.

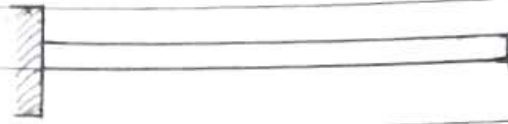
→ ① Simply supported beam:-

If the beam is having hinged or pinned support at the one end and roller support at the other end or the roller support at both the ends are called as simply supported beam:-



② Cantilever beam:-

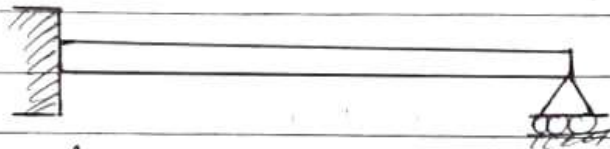
It is a type of beam where one end of the beam is fixed and the other end of the beam is free is called as cantilever beam.



Cantilever beam.

③ Propped Cantilever beam:-

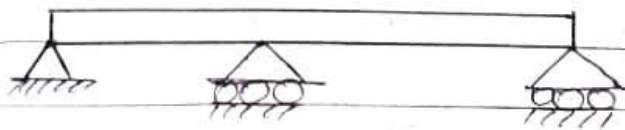
In this type of beam the one end of the beam is fixed and the other end is simply supported is called propped cantilever beam.



Propped cantilever beam.

④ Continuous beam:-

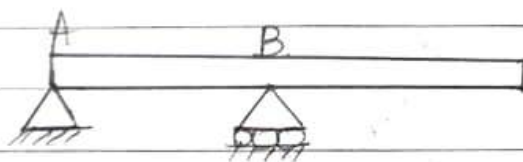
In this type of beam the beam is provided with more than two supports is called as continuous beam.



Continuous beam.

⑤ Over hanging beam:-

In this type of beam the beam is extended beyond the support is known as Over hanging beam. In this beam A and B are the supports it even extended beyond the support B. It can be also considered as Cantilever beam, the overhanging may be at one side or both the sides.

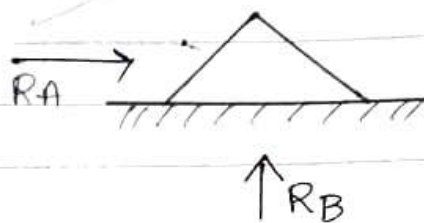


→ Supports :-

- ① Hinged support
- ② Roller support
- ③ Fixed support
- ④ Simple support.

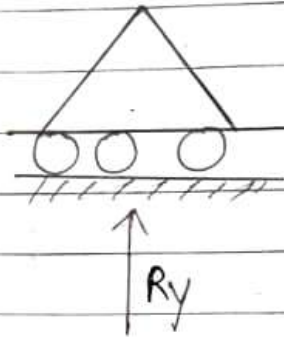
① Hinged support :-

It is a where translational displacement is not possible but it is free to rotate. In plane figure. It prevents the beam to rotate in horizontal direction as well as vertical direction but no momentum is developed.



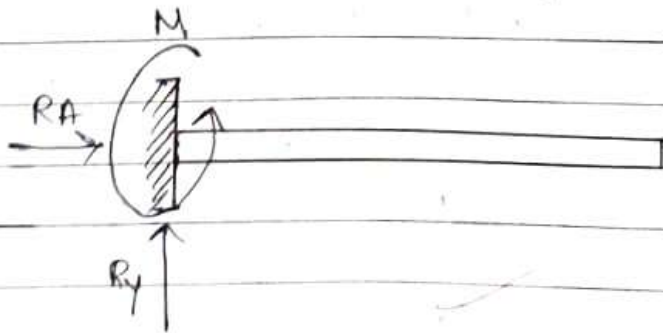
(2) Roller support:-

In this support the beam can move only in horizontal direction but not in vertical direction depending upon the Roller support provided.



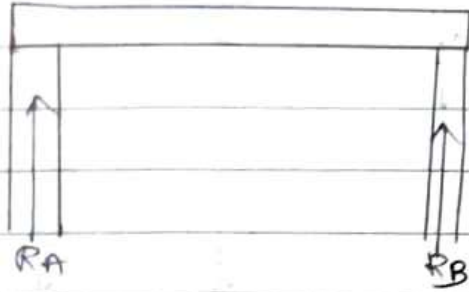
(3) Fixed support:-

In this support the translational displacement is not possible the beam will be fixed from both the ends so that it will not be able to rotate. This support prevents the beam from moving in horizontal direction as well as vertical direction, and moment is also exerted in this support.

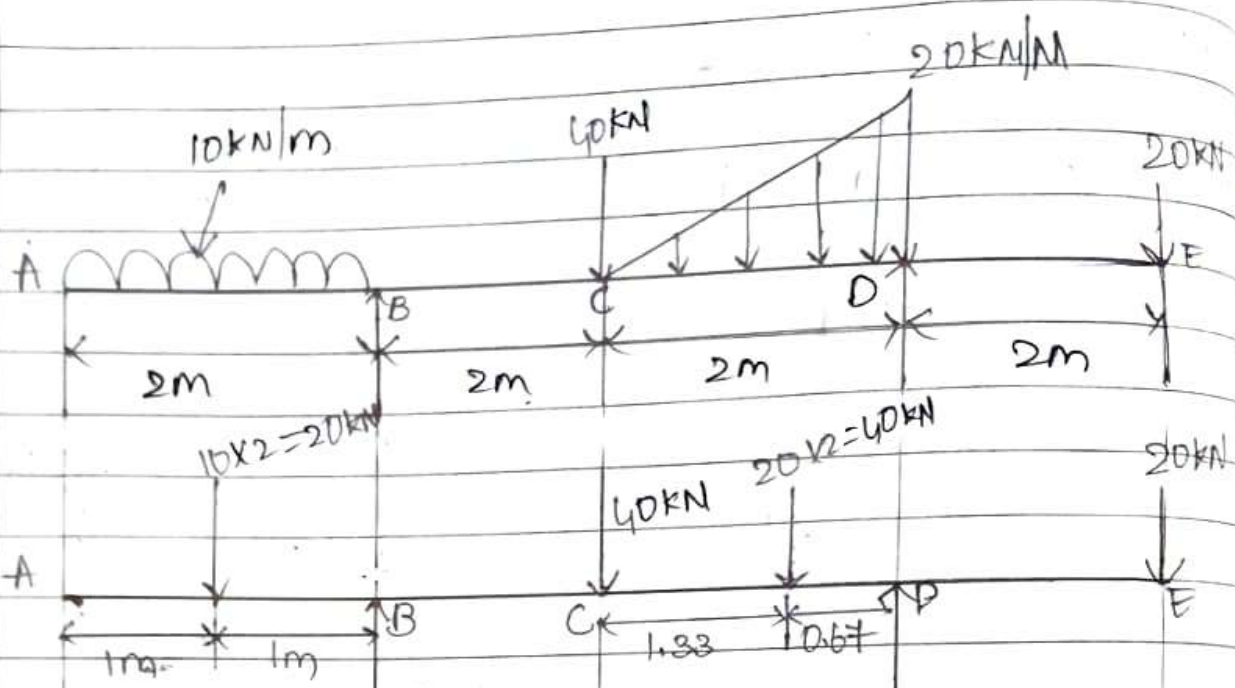


(4) Simple Support :-

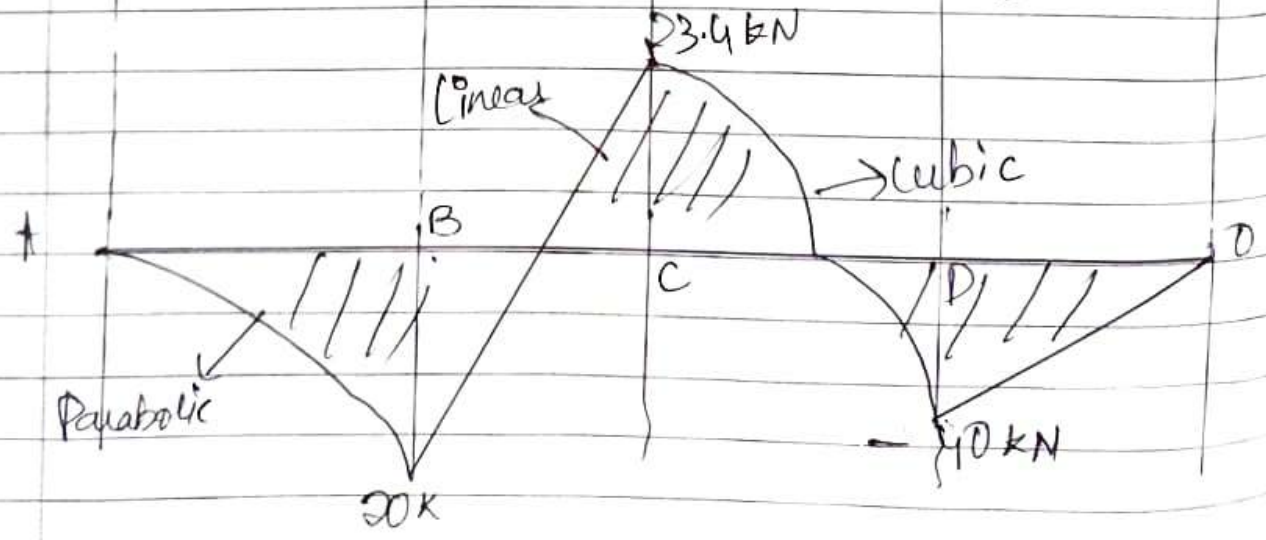
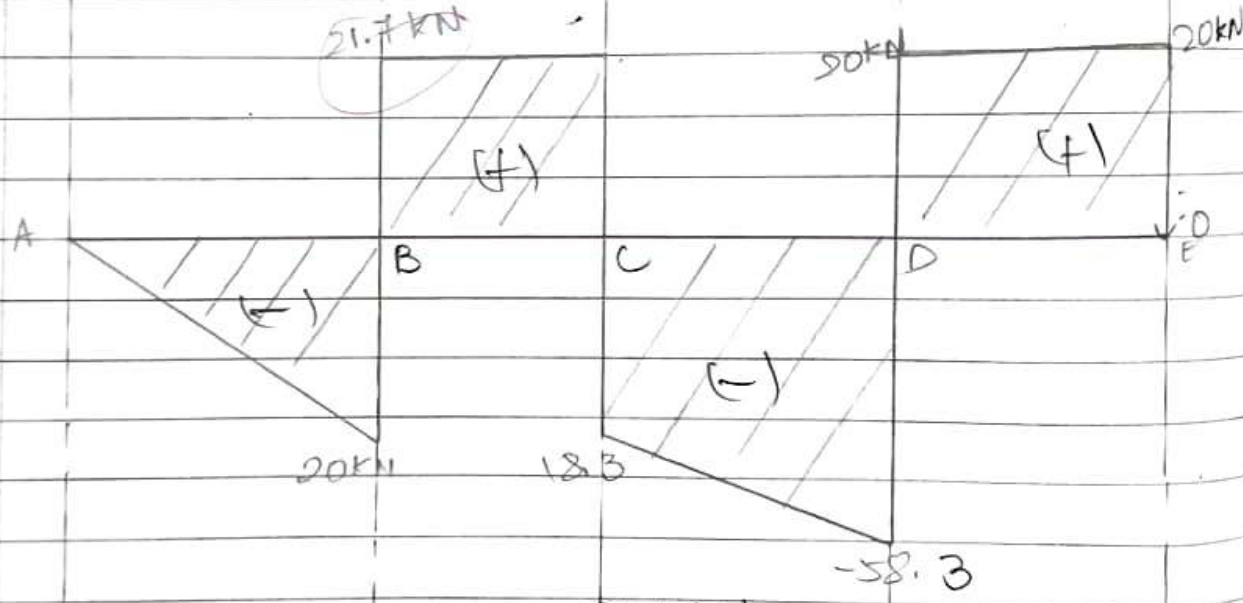
In this support there is only vertical reaction. It cannot rotate.



3b



$R_B = 41.7 \text{ kN}$
 $R_D = 78.3 \text{ kN}$



Applying equilibrium condition :

$$\sum F_y = 0$$

$$-20 + R_B - 40 - 40 + R_D - 20 = 0$$

$$R_B + R_D = 120 \text{ kN} \rightarrow \textcircled{1}$$

$\sum M_A = 0$

$$+(20 \times 1) + (R_B \times 2) + (40 \times 4) + (40 \times 5.33) - (R_D \times 6) + (20 \times 8) = 0$$

$$\sum M_B = 0$$

$$-(20 \times 1) + (40 \times 2) + (40 \times 3.33) + (20 \times 6) - (R_D \times 4) = 0$$

$$R_D \times 4 = 313.2$$

$$R_D = \frac{313.2}{4}$$

$$R_D = 78.3 \text{ kN}$$

Substitute in Eqⁿ $\textcircled{1}$

$$R_B + R_D = 120$$

$$R_B + 78.3 = 120$$

$$R_B = 120 - 78.3$$

$$R_B = 41.7 \text{ kN}$$

Shear force :-

$$SF @ \text{ Pnt A} = 0$$

$$SF @ \text{ Pnt B} = -20 \text{ kN} + 41.7 = 21.7 \text{ kN}$$

$$SF @ \text{ Pnt C} = 21.7 - 40 = -18.3 \text{ kN}$$

$$SF @ \text{ Pnt (to D)} = -18.3 - 40 = -58.3 \text{ kN}$$

$$SF @ \text{ Pnt D} = -58.3 + 78.3 = 20$$

$$SF @ \text{ Pnt E} = 20 - 20 = 0$$

Bending moment :-

$$BM @ A = 0$$

$$@ B = (20 \times 1) = -20$$

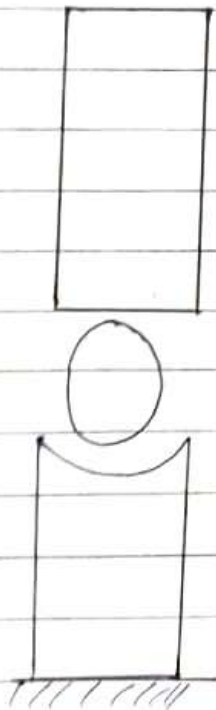
$$@ C = -(20 \times 3) + (41.7 \times 2) = 23.4$$

$$@ D = -(20 \times 5) + (41.7 \times 4) - (40 \times 2) - (40 \times 0.67) \\ = -40$$

$$@ E = -(20 \times 7) + (41.7 \times 6) - (40 \times 4) - (40 \times 2.67) \\ = (78.3 \times 2) = 0$$

Module - 1

(15)



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USN 1 D B



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Department of Management Studies & Research Internal Assessment Test –I (A.Y-2023-24)

Good

Course Name: RM & IPR
Semester: II

Course Code: 22MBA23
Max marks: 50

Date: 20/08/23
Time: 10:00 – 11:30 am

Note : Answer any Two full questions from Part – A (Each set carries 20 Marks)

Part – B is Compulsory (Question carries 10 Marks)

Question no.	Questions	MARKS	CO	RBTL
PART – A				
1	A What is Research?	03	1	1
	B Explain the objectives of Research.	07	1	2
	C Explain different types of Research in detail.	10	1	2
2	A Give the meaning of Exploratory Research.	03	1	1
	B Write a note on Descriptive Research Design and its types.	07	1	1
	C Explain the errors affecting Research Design.	10	1	1
3	A Give the meaning of Research Design.	03	1	1
	B Explain ethical issues in Business Research.	07	1	1
	C Explain different types of Experimental Research design in detail.	10	1	2
PART – B (Compulsory)				
4	Explain the Research process in detail with an example.	10	1	2

Students will be able to

CO1- Understand various research approaches, techniques and strategies in the appropriate in business.

USHA-G, *usha.g*
Name & Signature of Course Instructor

Scrutinized by (Name & Signature)

- 1) *Teena -g*
- 2) *Shrinesha*
- 3) *M. Shalini*

HOD signature

[Signature]
20/08/24



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Department of Management Studies and Research



Internal Assessment - SCHEME OF EVALUATION

Name of the Course: RM & IPR
Max Marks: 50

Course Code: 22MBA 23 Semester: IV
Faculty Name: U.S. G. Date: 16/08/24

Q. NO	SCHEME & SOLUTION	MARKS
1a)	<p>Research - Research in common parlance refers to a search for knowledge. One can also define research as a scientific & systematic search for pertinent information on a specific topic.</p>	3 marks
1b)	<p><u>Objectives of Research.</u></p> <ul style="list-style-type: none"> * To find out the truth which is hidden & which has not been discovered as yet * To gain familiarity with a phenomenon & to achieve new insights into it. * To portray accurately the characteristics of a particular individual, situation & a group. * To test causal relationship b/w variables. * To develop new tools, concepts & theories for studying unknown phenomena. * To promote better decision-making 	7 marks

Q.17c) Types of Research.

- * Descriptive Research
- * Exploratory Research
- * Causal Research
- * Qualitative Research
- * Quantitative Research
- * Applied Research
- * Basic / Pure Research
- * Empirical Research
- * Conceptual Research

Q.17a) Exploratory Research - It is defined as a research used to investigate a problem which is not clearly defined. It is conducted to have a better understanding of the existing problem but will not provide conclusive results.

Q.17b) Descriptive Research - To describe characteristics of a population, phenomenon, & situation. It answers questions about the what, where, when, and how much but does not necessarily explain the cause & effect relationship.

(15) marks

(3) marks

Methods of Descriptive Research Design.

- * Surveys & Questionnaires
- * Observational Studies
- * Cross-sectional Studies
- * Longitudinal Studies

(7 marks)

Q7c) Errors affecting Research Design.

- * Sampling Errors
- * Measurement Errors
- * Design related Errors
- * Data collection Errors
- * Ethical Errors
- * Statistical Errors
- * External Validity Errors
- * Researcher Bias

(6 marks)

Q7d) Business Research Design - It is the framework or Blueprint for conducting a research study. It outlines the methods & procedures for collecting & analyzing data to answer specific research questions.

(3 marks)

3(b) Ethical issues in Business Research.

- Violating non-disclosure agreement
- Breaking participants confidentiality
- Mis-representing results
- Exposing people & respondent names
- Plagiarism
- Avoiding legal liability.

3(c) Different types of Experimental Research Design

- 1) Pre-Experimental Design
- 2) True-experimental Design
- 3) Quasi experimental Design

PRE-EXPERIMENTAL DESIGN

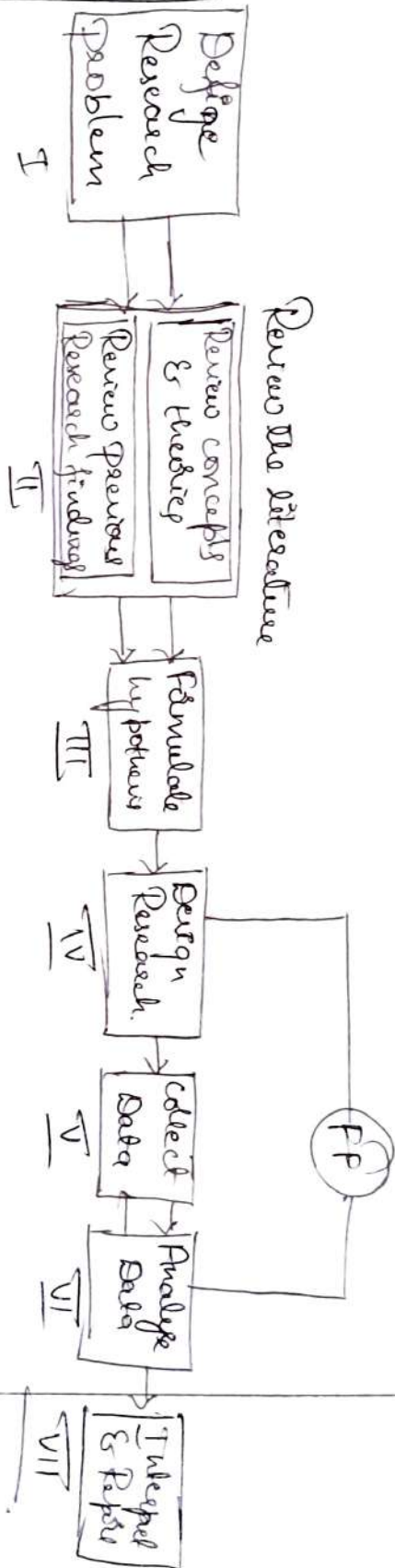
- One-shot case study Design
- One-Group Pretest-Posttest Design
- Static Group Comparison

TRUE-EXPERIMENTAL DESIGN.

- Pretest-Posttest Control Group Design
- Posttest-Only Control Group Design
- Solomon Four Group Design.

PART-B

RESEARCH PROCESS



10 marks

49



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Department of Management Studies & Research Internal Assessment Test –II (A.Y-2023-24)

18/09/24

Course Name: RM & IPR
Semester: II

Course Code: 22MBA23
Max marks: 50

Date: 24/09/24
Time: 10:00 – 11:30 am

Note: Answer any Two full questions from Part – A (Each set carries 20 Marks)

Part – B is Compulsory (Question carries 10 Marks)

Question no.	Questions	MARKS	CO	RBTL
PART – A				
	A What is Sample?	03	2	1
	B Explain the process of designing the questionnaire.	07	2	2
	C Explain different types of Sampling with example.	10	2	2
2	A Give the meaning of Editing.	03	2	1
	B Explain different methods of Primary data	07	2	2
	C Explain advantages and disadvantages of Secondary data	10	2	2
3	A Give the meaning of Non-probability sampling.	03	2	1
	B Explain basic measurement scales with an example.	07	2	2
	C Explain different types of attitude measurement scale with an example.	10	2	2
PART – B (Compulsory)				
4	Frame a questionnaire which consists of 10 questions on the study "The investor's perception on Mutual Fund in Indian Capital Market".	10	2	2

Students will be able to

CO2- Apply a range of quantitative / qualitative research techniques to business and day to day management problems.

USHA.G. aisha G
18/09/24
Name & Signature of Course Instructor

Scrutinized by (Name & Signature)

- 1) Teena.4
- 2) M. Chalini
- 3)

HOD signature

18/09/24

DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalgotu, Mysore Road, Bengaluru - 74

Department of Management Studies and Research

Internal Assessment - SCHEME OF EVALUATION

Name of the Course: RM & IPR

Course Code: 22MBA23

Semester: II

Max Marks: 50

Faculty Name: U.SHA - G

Date: 19/09/24

Q. NO	SCHEME & SOLUTION	MARKS
17a)	<p>Sample - Sample is a part of the population which represents the entire population. In simple words, sample is a small part of the population.</p>	3 marks
b)	<p>Process of designing the questionnaire</p> <pre>graph TD; A[Define the population] --> B[Identify the sampling frame]; B --> C[Specify the sampling unit]; C --> D[Selection of sampling method]; D --> E[Determination of sample size]; E --> F[Specify sampling unit]; F --> G[Selection of sample];</pre>	
17c)	<p>Types of Sampling Techniques</p> <ul style="list-style-type: none">Probability Sampling<ul style="list-style-type: none">Random SamplingSystematic SamplingStratified Random Sampling	

- * Cluster Sampling
- * Multistage Sampling
- * Area Sampling

2) Non-probability Sampling

- * Deliberate Sampling
- * Shopping mall intercept
- * Sequential Sampling
- * Quota Sampling
- * Snowball Sampling
- * Panel Sampling

2) Editing - Editing is an indispensable process to improve the quality of the research, which includes checking the content, organizing the content etc.

2) Diff methods of Primary Data

- a) Surveys and questionnaire
- b) Interviews
- c) Observations
- d) Experiments
- e) Focus group
- g) Field Trials

3/3 Advantages of Secondary Data.

- * It is economical
- * Time saving
- * Helps in understanding the problem
- * Provides a basis for comparison
- * Helps in identifying the gap.

Disadvantages of Secondary Data.

- * Accuracy is not known
- * Data may be outdated.
- * It seldomly fits in the framework

3/2/5 Non-probability sampling - Each and every unit in the population doesn't have the equal chances of being selected.

3/5 Basic Measurement Scales

- * Nominal Scale
- * Ordinal Scale
- * Interval Scale
- * Ratio Scale.

(10) marks

(3) marks

(7) marks

37) Types of Attitude measurement Scales.

- Likert Scale
- Semantic Differential Scale
- Thurstone Scale

Part - B - Compulsory4) Section A - Demographic information

1) Age.

- Below 25 yrs
- 25 - 35 yrs
- 36 - 45 yrs
- 46 - 60 yrs
- Above 60 yrs

2) Gender:

- Male
- Female
- Other

3) Eduⁿ Qualification

- High School
- UG
- PG
- Professional

Section B - Investment Habits & Preferences

5) How you ever invested in MF?

- Yes
- No

6) If yes, for how long have you been investing in MF?

- Less than 1 yr
- 1-3 yrs
- 3-5 yrs
- More than 5 yrs

7) What type of MF do you prefer?

- Equity
- Debt
- Hybrid
- Sector-specific
- Index
- Other

8) What is the primary purpose of your MF investment?

- Wealth Creation
- Retirement planning
- Children's Edu
- Tax Saving
- Emergency fund.

9) What % of your total investment portfolio is allocated to MF?

- a Less than 10%
- " 10% - 30%
- " 31% - 50%
- " Above 50%

10) Do you believe MFs are a better investment option than traditional options like F&C Gold?

- " Strongly agree
- " Agree
- " Neutral
- " Disagree
- " Strongly disagree.



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Department of Management Studies & Research
Internal Assessment Test -III (A.Y-2023-24)



Course Name: RM & IPR
Semester: II

Course Code: 22MBA23
Max marks: 50

Date: 17/10/24
Time: 10:00 - 11:30 am

Note : Answer any Two full questions from Part - A (Each set carries 20 Marks)
Part - B is Compulsory (Question carries 10 Marks)

Question no.	Questions	MARKS	CO	RBTL
PART - A				
1	A Give the meaning of Tabulation.	03	3	2
	B Explain the importance of report writing.	07	3	2
	C Explain different types of report writing.	10	3	2
2	A Give the meaning of Coding	03	3	2
	B Explain the guidelines to follow for effective documentation of reports.	07	3	2
	C Explain the Report Structure in detail.	10	3	2
3	A Give the meaning of Data Analysis	03	3	2
	B Explain the nature of Intellectual Property.	07	5	2
	C Explain the kinds of Intellectual Property	10	5	2
PART - B (Compulsory)				
4	<p>A university professor decided to investigate the impact of online learning on student performance in higher education during the COVID-19 pandemic. The research aimed to compare academic performance before and during the pandemic, examining whether students enrolled in online courses demonstrated higher or lower performance compared to those attending in-person classes.</p> <p>To gather data, the researcher employed a mixed-methods approach, combining quantitative and qualitative research. The quantitative part involved analyzing students' grades and academic records from two consecutive academic years. The qualitative aspect focused on in-depth interviews with students and teachers to understand the challenges and benefits of online learning.</p> <p>A stratified sampling method was used to ensure the diversity of participants across faculties and disciplines. Data analysis included descriptive statistics to summarize the grade data, and thematic analysis for interview transcripts.</p> <p>The research revealed that, while students' grades remained stable overall,</p>	10	4	2

certain groups—especially first-year students and those from lower-income households—struggled more in online environments. This prompted further investigation into the socio-economic factors affecting online learning outcomes.

Questions:

- 1) What are the advantages and limitations of using a mixed-methods approach in this research?
- 2) How does stratified sampling contribute to the accuracy of the research findings?
- 3) What ethical considerations should the researcher have addressed when conducting interviews with students?
- 4) How could the findings of this research inform future educational policies on online learning?



Name of
Max

Students will be able to

CO3- Demonstrate knowledge and understanding of data analysis, interpretation and report writing.

Develop necessary critical thinking skills in order to evaluate different research approaches in Business

CO5- Discuss various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR.

USHA.G, usha.g
14/10/24
Name & Signature of Course Instructor

Scrutinized by (Name & Signature)

- 1) Dr. Prema C. [Signature]
- 2) BUVANESWAR P. [Signature]
- 3) RAJA SHEKHAR E. [Signature]

[Signature]
HOD signature



DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalgotu, Mysore Road, Bengaluru -74



Department of Management Studies and Research

Internal Assessment - SCHEME OF EVALUATION

Name of the Course: RM & IPR
Max Marks: 50

Course Code: 22MBA23
Faculty Name: USHA.G

Semester: II
Date: 4/10/24

Q. NO	SCHEME & SOLUTION	MARKS
12a)	<p>Tabulation- Tabulation is a process of summarizing raw data & displaying the same in compact form. It is an orderly arrangement of data in columns and rows</p>	3 marks
17b)	<p><u>Importance of report writing.</u></p> <ul style="list-style-type: none"> * Clear communication of findings * Decision-making tool * Record Keeping & Documentation * Sharing Knowledge * Accountability & Transparency * Organizing complex information * Legal & Regulatory compliance. 	7 marks
17c)	<p><u>Different types of Report</u></p> <ul style="list-style-type: none"> * Technical Report * Business Report * Market Research Report * Survey Report 	

- Case Study Report
- Progress Report
- Evaluation Report
- Annual Report
- Environmental Report
- Financial Report

Q.7 Coding - It refers to the process of assigning numerals & other symbols to answers so that responses can be put into a limited number of categories or classes.

Q.8 Guidelines to follow effective documentation of reports

- Understand the purpose & Audience
- Organize information logically
- Use clear & concise language
- Provide accurate & complete information
- Use visual aids effectively
- Document Methodology & Sources
- Review & Revise
- Include an executive Summary

Report Start
11 Title Page
25 At

10 marks

3 marks

7 marks

27Q Report Structure

- 1) Title Page
- 2) Abstract
- 3) Table of contents
- 4) Introduction
- 5) Literature Review
- 6) Methodology
- 7) Data Analysis
- 8) Results
- 9) Discussion
- 10) conclusion

(10) marks

37Q Data Analysis - Data analysis refers to the process of systematically applying statistical & logical techniques to describe, summarize & evaluate data.

(3) marks

37b Nature of Intellectual Property

- Intangible Assets
- Exclusive Rights
- Territorial
- Limited Duration
- Transferable

(7) marks

3707 Kinds of IP

- Patents
- Trademarks
- Copyrights
- Trade Secrets
- Geographical Indications

(10)

CASE STUDY

4207 Advantages

This mixed methods approach allows for a more comprehensive understanding of the research problem by combining grades with interviews.

Limitations

This method is time consuming and complex.

By segmenting the population represented in the study into sub-groups (strata), it reduces sampling bias and ensures that the performance differences among different groups

↳ The researcher should have obtained informed consent from all participants, ensuring they

fully understood the study's purpose & their right to withdraw at any time. Confidentiality should be maintained to protect participants' identities

ds Educators' institutions may use the data to enhance online learning platforms, provide training for educators & create more flexible, hybrid learning models that cater to diverse learning needs.

(10 marks)

WAYANAMAC EDUCATION TRUST (R)

DON BOSCO INSTITUTE OF TECHNOLOGY

Mysore Road, Kumbalagodu, Bengaluru – 560074



BLUE BOOK

Name: Akshatha G. Rao

USN: 19B23BA003 SI.No. (for First year - Students only)

Subject: Research Methodology and GPR Subject Code: 22MBA23

Branch: MBA Semester: 2nd sem. Section:

Test No	Date	Max. Marks	Marks Obtained	Signature of the Faculty
I	20/8/24	50	43	<u>Akshatha</u>
II	24/9/24	50	44	<u>Akshatha</u>
III		<u>Ab</u>		<u>Akshatha</u>
I A Marks (Average of three tests marks)				

Akshatha Rao

Signature of the Student

Akshatha

Signature of the Faculty

Declaration by the Student:

- I know that I am not allowed to borrow any instruments/calculator/pen/pencil eraser/sharpener etc... From anybody in the test hall.
- I will not be indulging in any Malpractice / Violation of instruction by the Room Invigilator.
- In case of violation, I may be sent out of the Test & I may not be allowed to attend classes any more till I get my parents (no matter whether they stay in India or abroad) / I may be given T.C.
- For the period I am not allowed to classes. I know I will be losing the Attendance.
- Mobile phones are not allowed inside the examination hall

Abhishek Rao

Signature of the Student

	Q. No	1	2	3	4	5	6	7	8	Total
I Test	a	2	2		9					
	b	6	6							
	C	9	9							
	Total	17	17		9					43
Signature of the Faculty : <u>Abhishek</u>										

	Q. No	1	2	3	4	5	6	7	8	Total
II Test	a	2		2	10					
	b	6		6						
	C	9		9						
	Total	17		17	10					44
Signature of the Faculty : <u>Abhishek</u>										

	Q. No	1	2	3	4	5	6	7	8	Total
III Test	a									
	b									
	C									
	Total									
Signature of the Faculty : <u>Abhishek</u>										

Part A

- 1) A) Research means search for knowledge.
Research means systematic and scientific search for pertinent information on a specific topic.
Research means an art of scientific investigation

According to Redman and Mory "it is a systematized efforts to gain new knowledge".

Q2

- 2) B) Research is referred to as the scientific and systematic search for pertinent information on a specific topic. Research means an art of scientific investigation.

The objectives of Research are:

- 1) To search for knowledge.
- 2) To find out the answers for the questions with the application of scientific procedures.
- 3) To find out the truth which has not been discovered yet.
- 4) To promote better decision making.
- 5) To test causal relationship between the

variables

(Here variable means independent variable and dependent variable)

- 6) To gain familiarity with a particular topic and gain ~~for~~ new insights into it.
- 7) To identify the problem areas and provide the basis for making the ~~new~~ innovations.
- 8) To portray accurately the individual, situation or a phenomena.
- 9) To get the maximum efficiency and reliability.
- 10) To extend man's knowledge, social life and environment.

ob
These above are the objectives of research.

1c) Research is a scientific and systematic search for pertinent information on a specific topic. Research means an art of scientific investigation.

According to Redman and Mory "is a systematized efforts to gain new knowledge".

Different types of Research are.

- 1) Descriptive Research
- 2) Exploratory Research
- 3) Explanatory Research -
- 4) Qualitative Research
- 5) Quantitative Research
- 6) Applied Research
- 7) Fundamental Research
- 8) Conceptual Research
- 9) Empirical Research

1) Descriptive Research.

Descriptive Research is a type of research methodology which describes the population, situation or a phenomena.

It does not manipulate the variables but records the information. It may be qualitative or quantitative and identifies the characteristics, trends and patterns.

In social science and business research, we use the term Ex-post facto for Descriptive research. The main characteristic of descriptive research is that it does not have control over the variables but reports what has happened and what is happening.

Example: A study examining demographics of online shoppers which includes, age, gender and shopping preferences.

2) Exploratory Research.

• Exploratory research is a type of research where we will explore a problem which is not well defined.

• It involves gathering preliminary information for defining the problem, and clarifying the concept.

• It is more flexible and open ended questions which involves literature review, expert interviews, focus groups and case studies.

• The main purpose of exploratory research is to explore a problem.

Example: Investigating emerging trends in eco-friendly packaging to the food and see the consumer attitudes and preferences.

3) Explanatory (Causal) Research.

Explanatory Research is the type of research which tells about cause and effect relationship between the variables.

Beyond describing, exploring. ~~it helps~~.
explanatory research says how one variable
influences the other variable.

It manipulates the independent variable and
sees its effect on dependent variable.

Example :- A researcher wants to know whether
the promotional discounts will increase the
sales of a product.

4). Qualitative research.

Qualitative research is studying the
meaning behind the human experiences,
behaviours etc.

It provides the non-numerical data
which includes interviews, focus groups,
observations etc.

This type of research is conducted to
understand the human's complex decisions,
emotions etc.

Example :- Studying impact of internet on
the teenager's self esteem.

Internet provides both advantages as well as
disadvantages. Advantages will be interaction
with the friends. Disadvantages will be
fluctuating self esteem etc.

5) Quantitative research

Quantitative research is gathering of quantifiable data and ~~reports~~ performing mathematical or computational techniques.

It helps to identify the trends and patterns.

Example: Impact of study habits on academic performance among high school students.

time Here the purpose is to increase the study habits and it can be done by ~~data~~ conducting ~~work~~ management workshops etc.

6) Applied research

Applied research is a type of research where we get ~~some~~ solutions for an immediate problem faced by a society, industry or organization.

Applied research provides solutions for practical problems and it also provides solutions for everyday problems.

Example: Treating a particular disease.
~~Improving~~ Improving the crop production in agriculture
increasing customer satisfaction in a hotel.

7) Fundamental research.

...

Fundamental research is driven by the scientist's interest on research questions.

It is done to increase the man's knowledge and not to innovate something new.

Questions may be like

- 1) How did the universe begin,
- 2) What do protons, neutrons and electrons consist of.

8) Conceptual research.

Conceptual research involves developing and clarifying concepts, theories etc.

Conceptual research is not empirical in nature it requires advance understanding through analysis, synthesis and critical thinking.

Example: Mergers and acquisitions occurred in India in a decade

a) Empirical research.

This research is based on evidence only.

Empirical research is based on observed and measured results.

It is based on collecting and analysing

the information through direct and indirect methods. and to get answers for research questions.

For example:- Impact of exercise on reducing depression

Here collecting and analysing of information is made to see whether exercise can reduce depression

These above are the types of research

2A) Exploratory research is a type of research where we explore a problem which is not well defined.

It involves gathering preliminary information for defining the problem and clarifying the concepts.

It is more flexible when compared to other types of research.

The main purpose of exploratory research is to explore a problem.

Example:- Investigating emerging trends in ecofriendly packaging to the food. To see the consumer tastes and preferences.

2B).

Descriptive Research design is a type which describes the population, situation or a phenomenon.

It does not manipulate the variables but records the information. It may be qualitative or quantitative and identifies the characteristics, trends and patterns.

The main characteristic of this is that it does not have control over the variables but reports what has happened and is happening.

The types of Descriptive Research design are

- 1) Surveys and Questionnaires.
- 2) Observational studies.
- 3) Cross-sectional studies
- 4) Longitudinal studies.

1) Surveys and Questionnaires .

Survey is recording of answers told by the respondents. Survey can even be a poll. This is the most used method in present scenario.

This survey can include open-ended questions or closed ended questions.

The survey is made to take the feedback from the respondents.

Survey can be conducted through online or offline mode.

Survey ensures that we get large amount of data in limited span.

2) Observational studies
Observational studies can be qualitative or quantitative.

Quantitative observational studies is where we collect gather the data and present in numerical form.

Example: Age, Weight, Height etc.

Qualitative observational studies read the characteristics of a phenomena. It gathers behaviours, attitudes.

Example:- Track the consumer traffic pattern in a store.

3) Cross-sectional studies.

Cross sectional studies is a observational study where it collects a data to study population at single point of time, to know the relationship between the variables.

Example:- Usage of internet by Millennials.

and being.

y) Longitudinal studies.

Longitudinal studies is also a observational study, but data is collected from the same sample over a period of time. It may take few years or even decades.

Example - Monitoring the changes in cyber-bullying of Millennials from 2022 to 2024.

06

21)

According to William Zickmund "Research design is the masterplan specifying methods and procedures for collection and analysing needed information".

Errors affecting research design include -

1) Sampling Error.

a) Sampling bias.

Occur when the sample collected does not represent the population. It may be due to non-sampling methods or improper selection of sample, which may lead to skewed results of not reflecting the

population

b) Sampling size error.

If sample size is too small, too big then it affects the reliability of the study. If sample size is too small, then we cannot grasp the population. If sample size is too large then it leads to wastage of resources.

2) Measurement Error.

a) Instrument Error.

Faulty tools or instruments is used to collect and analyze the data. It may be improper questionnaires, or using tool that do not represent the specific population.

b) Response bias.

When the respondent is giving ~~an~~ inaccurate information due to social desirability, lack of interest, misunderstanding questions etc which may lead to wrong conclusions.

3) Design related error.

a) - Poorly defined variables.

Ambiguity in defining the variables can lead to inconsistencies in collection and analysis of data.

b) - Improper research methodology.

Not using proper ^{research} methodology (for example, instead of quantitative research, they have used qualitative research), can lead to wrong conclusions. The type of research chosen should align with the questions and objectives of research.

4) Data Collection errors.

- Non response error

When the respondents are not responding to the researcher then it leads to non-response error. If non-respondents differ significantly from respondents, then it causes a major change in study's outcomes.

- Data recording errors.

Data has been ^{not} recorded properly due to manual errors, software errors etc. It includes transcription errors, coding errors etc.

5) Ethical errors

- Informed consent error
Failing to take a proper informed consent, or not ^{informing} taking the ~~case~~ respondent that they are conducting on a particular topic.

- Privacy and Confidentiality breaches.
Failing to protect the person's identity will lead to ethical issue.

6) Statistical error.

- Incorrect data analysis -
Using wrong statistical method to ~~an~~ analyse the data. ~~Use~~
Misrepresenting the statistical results can lead to improper conclusions.

- Over generalization

Make a broad claims with limited data can affect the reliability of the study. Researchers must be cautious while making any generalization beyond the research context.

7) External validity errors.

- Lack of generalization

∴ Sample is not representing the entire population which later leads to lack of generalisability. It happens when we conduct a study on the homogeneous variables.

8) Research bias

- Confirmation bias

Researchers ~~will~~ unintentionally interpret the data based on pre-conceived notions.

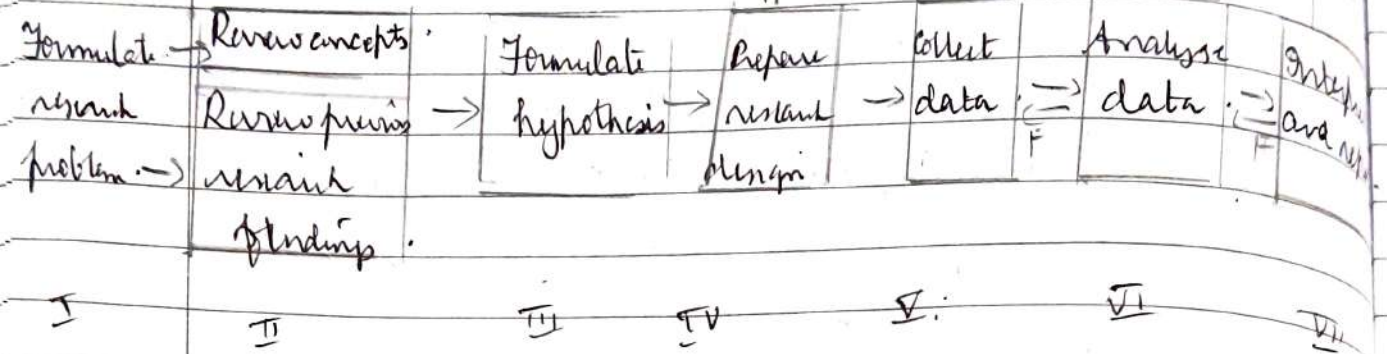
- Selection bias

Researchers unintentionally or ~~can~~ intentionally select the participants to get a desired outcomes.

09 These above are the errors affecting the Research design.

Part B (Compulsory)

Review literature



Research is a scientific and systematic search for pertinent information on a specific topic. It is an art of scientific investigation.

It is a systematized efforts to gain new knowledge.

Research Process

Example:-

1) Formulate research problem.

There are two kinds of research problem one is to understand the nature of something and the other is to see the relationship between the variables.

When the researcher starts, researcher has to identify the problem on which he has to study. It means he must have a general topic or area of interest to investigate. Initially the problem will be in broader terms, later the problem has to be unclumped as the research progresses.

Example :- Has to study the increase in consumer satisfaction in online grocery shopping.

2) Review concepts literature.

At this stage they have to see the people who have done research in the similar topic. Abstracting and indexing journals, published or unpublished bibliographies are the first place to visit.

Academic journals, books, reports are the things that has to be tapped in depending on the problem.

Example : In this case he has to review the digital marketing, consumer behaviour research topics etc.

3) Formulate the working hypothesis

Working hypothesis is the temporary assumption to explore or to test its logical outcomes

Example :- "What are the factors that influence consumer satisfaction"
"Does delivery speed and product quality increase consumer satisfaction"

4) Prepare the research design.

Once research problem is formulated then research design has to be prepared. This research design helps to make the research process as efficient as possible.

Example -

Types of research - Quantitative research, Qualitative research

Tools, - Survey, experiments etc.
Plan data collection - Sampling method -
Data collection tools.

Using quantitative - survey method to collect data on online grocery shoppers.

5) Collect the data.

• ~~Coll.~~ Researchers has to collect the proper and relevant data. They can collect data from various methods by considering time, efforts, money etc.

Primary data is also collected through experiment.

Example - ~~Coll~~ preparing questionnaire and collecting data on product quality, delivery speed etc

6) Analyse the data:

Analysis of data is made by organizing the data into categories, coding the raw data, tabulation and providing the statistical conclusions

Example :- Here ~~with~~ in this example we can use regression analysis to analyse data

7) Interpret and report

Based on the analysis interpretation is made and report is prepared.

For example :- If we find out that there delivery speed and product quality

increases customer satisfaction. Then we present it in graphs, charts etc.

We should provide statistical conclusions and also provide recommendations to improve the logistics to minimize the delays.

And ^{Review} band on this. Report will be prepared

09

~~Exhibit~~
~~20/08/24~~

II. Internals

Part A

1. A) Sample is a part of the target population, which has to be carefully selected so that it represents the entire population.

Q2 - Example: Telephone directory, yellow pages etc.

B) The process of designing a questionnaire.

1) Define the research objectives.

Start by clearly defining the research objectives. Understand the specific information that is needed and see how it is useful.

Example: If you have to assess the customer satisfaction with a new smartphone, then the questionnaire must focus on the questions like product quality, customer service etc.

2) Identify your target audience.

~~Identify~~ Determining who is answering your questionnaire. Understand the demographics, characteristics and ~~for~~ behavior of them so that it becomes easy to prepare the questions and it also becomes easy for them to answer the questions.

Example: If target audience is teenagers, the age.

of the target audience must be considered.

3) Determine your content and scope

Decide the areas that your questionnaire is going to cover and ensure it aligns with the research objectives.

Example:- If you have to evaluate a new software tool, include questions such as usability, features, performance and customer support.

4) Choose question types

Open ended question -

Under open ended questions the respondents can give their own answers and it leads to detailed responses.

Closed ended questions

Under closed ended questions the respondents must answer the predefined questions and it helps in statistical analysis.

5) Draft the questions

a) Clarity - The questions must be as clear as possible and should not include technical terms.

- b) Brevity - The questions must be concise to avoid respondent's fatigue.
- c) Neutrality - Ensure to avoid biased questions that influence respondent's answers.
- d) Avoid double barreled questions
Ensure your question should address a specific topic or issue.

6) Organize the questions.

Logical flow - There should be logical order where general questions are first and later specific ones.

Introductory part - It should mention the purpose of your survey, how it will be used and assure confidentiality to respondents.

Sensitive questions last - Sensitive questions should be at the last once respondents are comfortable.

Easy questions must be placed in beginning.

7) Pilot test the questionnaire

Purpose - Test the questionnaire with a small,

representative sample to know the questions' clarity and structure.

Feedback - Get feedback about the questionnaire length and question wording.

Refinement - After receiving the feedback make the changes if any to ensure questions are effective as possible.

8) Analyze the questionnaire -

Review and edit - Review the entire questionnaire to reduce errors and ensure it aligns with the research objectives.

Length - The length of the questionnaire must be less.

9) Determine the distribution method -

Decide the distribution method based on the target audience and research objectives.

If it is online, then the platform must be accessible and userfriendly. If it is in person, the setting should be convenient.

10) Collect and Analyze data

After getting responses, analyze the data with the help of ~~an~~ data analysis tools to identify the trend, pattern etc.

26
c) Sample is a part of the target population which has to be carefully selected in such a way that it represents the entire population.

There are 2 types of sampling.

- 1) Probability sampling.
- 2) Non probability sampling.

Probability sampling -

In this sampling every units of the population have equal chances of being selected.

Different types of probability sampling are -

- 1) Random sampling
- 2) Systematic sampling
- 3) Stratified sampling
- 4) Cluster sampling
- 5) Multistage sampling
- 6) Area sampling

1) Random sampling -

Simple random sample where every ~~unit~~ ^{item} in the population have equal probability of being selected.

There are 2 types of random sampling.

1) Lottery method -

2) Using random number table.

2) Systematic Sampling -

First units are chosen

The rest of the units are systematically selected.

One unit from first and K th unit of the population is randomly chosen.

It is denoted by formula

~~It~~

Systematic sampling = $\frac{\text{Number of units in the population}}{\text{Number of units desired in the sample}}$

3) Stratified Sampling

The probability sample procedure under which simple random sub-samples are drawn from within different strata.

Two types of stratified sampling are -

1) Proportionate Stratified Sampling.

2) Disproportionate Stratified Sampling.

4) Cluster sampling

The population is divided into clusters. A simple random sample of few clusters is selected. All the units of the selected cluster are studied.

5) Multistage sampling

As the name says it is the sampling that happens in various levels. It uses stratified / cluster designs.

6) Area sampling

It is a form of cluster sampling where cluster is formed on the basis of geographical locations.

Two types of area sampling

- 1) One stage area sampling
- 2) Two stage area sampling

Non probability sampling

In this sampling all the units in the population have unequal or negligible almost no equal chances of being selected. Different types of non-probability sampling are:

7) Deliberate sampling

This is known as judgemental sampling.

Here the investigator uses his discretion in

selecting the sample from the universe
there is no bias in the selection

2) Shopping mall intercept sampling

Mall intercept interview is a research method where mall visitors are stopped and taken interview.

Mall intercept survey has target population from different locations and take feedback at point of experience.
Ex: People entering supermarket are stopped and asked on opinion on new smartphone launched.

a) Quota sampling

It is usually fixed and it has to be fulfilled by the interviewers.

Ex: Suppose 20,000 students are appearing for the competitive examination. We have to select 1% of them on basis of the quota.

b) Snowball sampling

In this sampling we will generate a sample based on the referrals.

Hence it is also known as chain referral.

network sampling.

Ex: collecting data from friend's relatives etc.

ii) Sequential sampling

This sampling is formed on the basis of successive decisions. The decision

is made whether further samples are required or not.

12) Panel sampling -

Here they will select group of participants by random sampling method and collect information from them over a period of time.

These above are the different types of sampling.

09
3A) Non probability sampling is where all the units in the population have unequal or negligible almost no equal chances of being selected. There are 6 types of non-probability sampling.

- 1) Deliberate sampling
- 2) Sequential sampling
- 3) Panel sampling
- 4) Snowball sampling
- 5) Shopping mall intercept sampling
- 6) Quota sampling

02
3B) Basic measurement scales are.

- 1) Nominal scale
- 2) Ordinal scale

- 3) Interval scale
- 4) Ratio scale

1) Nominal scale

It is the most basic level of measurement scale used in statistics, where the data is categorized without order.

The category is mutually exclusive, and each item can fall in one category.

The placement of data into categories without ranking or order. This is the crudest of all the measurements where classification of individuals, companies, products, brands and other entities are made.

This is also known as categorical scale. It involves simple count of numbers assigned to label each category.

Example:

Mode of transportation preferred by people.

1 = Car

2 = Bicycle

3 = Scooty

4 = Train

Here 1, 2, 3, 4 is assigned for the

classification or identification purpose. It does not mean that car is superior than bicycle. No ranking is given here. We can also use other names or alphabets such as (eg A = car, B = Bicycle, C = Scooter, D = Train). But the meaning remains the same.

Example :- ~~fruits~~ Types of fruits
Apple, Banana, Watermelon, Orange.
They are distinct from each other but there is no ranking provided.

2) Blood type
AB, A, B, O.

They are distinct but no ranking is provided.

2) Ordinal scale.

Ordinal scale is the measurement scale where data is categorized and ranked. Unlike nominal scale, ⁱⁿ ordinal scale the things can be ranked. But the interval between the ranks necessarily not be same. The classification that implies an order is called Ordinal scale. Here it involves ranking of individuals, products, brands and other entities.

Example

1 = Extremely unsatisfied
2 = Unsatisfied
3 = Neutral.

4 = Satisfied

5 = Extremely Satisfied

Here proper ranking has been given. Highly satisfied is higher than satisfied is higher than neutral but the difference between highly satisfied and satisfied may not be the same. It have the same difference that of satisfied and neutral.

Example

Socioeconomic status = Low, Middle, High

They are ranked properly, but the difference between low and middle is not same as middle and high

3) Interval scale

Interval scale is the measurement scale where the difference between the meanings are meaningful and consistent but lacks true zero point.

Which means we can say one ~~thing~~ ^{aspect} is more than the other aspect, but we cannot say that one aspect is twice that of the other aspect.

Example - The difference between IQ of 100 and 110 is same as the difference between IQ of 110

and 100, but the IQ of 0 cannot represent complete lack of intelligence.

Ex: The difference between 1 pm and 2 pm is same as the difference between 2 pm and 3 pm but the true zero time does not exist on clock.

4) Ratio Scale

Ratio scale is the highest measurement scale where the difference between values and ratio between values are meaningful and consistent. There exists true zero point which means zero represents complete absence of quantity being measured.

Example: The weight of 10 kg is twice as weight of 5 kg, zero weight means absence of weight.

Example: The height of 6 feet tall is twice as height of 3 feet tall, zero height means no height.

These above are the basic measurement scale.

3c). Attitude measurement scale is a tool used to in survey, psychology and social research to measure attitudes, behaviours, opinions, feelings and perceptions towards a particular object, concept etc.

Different types of attitude measurement scale ~~are~~ are :-

- 1) Likert scale
- 2) Semantic differential scale
- 3) Thurstone scale
- 4) Guttman scale
- 5) Staple scale

1) Likert scale

One of the basic attitude measurement scale where the respondents will provide their level of agreement or disagreement towards a series of statements.

A Likert scale is to measure the attitude, behaviours, feelings towards a particular subject.

A series of statements will be given and respondents has to rate their level of agreement or disagreement towards those series of statements.

It may range from extremely satisfied to

extremely ~~dis~~satisfied with a neutral midpoint
There will be 5 point Likert scale ~~and~~ 7.
point Likert scale.

Example .

How would you ~~rate~~ ^{feel} ~~over~~ about our
customer service .

- | | | |
|---|-------------------------------------|--------------------------|
| 1 | <input checked="" type="checkbox"/> | Extremely satisfied |
| 2 | <input type="checkbox"/> | Satisfied |
| 3 | <input type="checkbox"/> | Neutral |
| 4 | <input type="checkbox"/> | Dissatisfied |
| 5 | <input type="checkbox"/> | Extremely dissatisfied . |

2) Semantic differential scale .

Semantic differential scale is a
attitude measurement scale where the respondents
will rate their experience on the basis of
bipolar adjectives pairs . They have to
mark a position between two opposing adjectives.

Characteristics ,

- 1) Bipolar adjectives
- 2) Interval scale .
- 3) Measures attitudes .

Example .

If you are evaluating a car model .

Expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Affordable
Modern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Old-fashioned
Efficient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inefficient

3) Thurstone scale

Thurstone scale was founded by Louis Thurstone in the year 1920. Here they will assign some numerical values to a series of statements based on their intensity.

They are a pre-defined values given by experts and respondents has to select depending on which they agree the most.

The average score of the statements given will be the attitude score.

Example

Statement - 1. Renewable energy is wastage of resources.
[1 = ~~mod~~ unfavourable]

Statement - 2. Renewable energy is expensive.
[4 = ^{moderately} unfavourable]

Statement - 3. Renewable energy is useful.
[6 = Neutral]

Statement 4. Renewable energy is better than other resources.

moderately.
($\therefore 8 = \text{Favourable}$).

Statement 5 - Renewable energy is a solution for climate change.
($3 = \text{Favourable}$).

Plus up the respondents select Statement 2 and 3 which means the average score of the respondent is 5, which means moderately unfavourable to neutral.

This above are the attitude measurement scale with sample.

Part B

Questionnaire on the study: "The investor perception on mutual fund in Indian Capital Market".

Questionnaire ~~consists~~ consists of both open ended and closed ended questions.

1) Have you ever invested in mutual fund. \star

Yes

No

2) If yes, from how many years ~~are~~ have you been.

Investing in mutual funds. *

- less than 2 years.
- 2-5 years
- 5-7 years
- 7 or more years.

3) Have you faced any loss by investing in mutual funds. *

- Yes
- No.

4) Do you feel that investing in mutual fund is a risky decision. *

- Yes
- No.
- Maybe.

5) ~~Do you feel~~ If yes, do you feel investing in any other field.

5) If yes, what are the other fields that are better in investing than mutual funds. *

- PPF
- RA
- Others.

6) In which mutual fund have you invested *

- SBI mutual fund
- LIC mutual fund.
- Other.

7) Which mutual fund you feel safer among the investments you have made till now ?

8) If you are comfortable, tell us what is the amount of investment that is made till now.

9) Tell us ~~what~~ one channel or website that provides complete information about the mutual funds.

10) .. What are the suggestions that you give for the people who is planning to invest in mutual funds



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DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH

ASSIGNMENT - I

Semester: II

AY: 2023-24

Course Name: Research Methodology & IPR

Sub Code: 22MBA23

Date of Assignment: 12/08/2024

Date of Submission: 14/08/2024

Q.No.	Questions	CO's	RBTL
1	Explain different types of Research with example	1	2
2	Explain Research Process in detail	1	2
3	Explain the objectives of Research in detail	1	2

CO1: Understand various research approaches, techniques and strategies in the appropriate in business.

Ushak
12/08/24
Course Co-ordinator

[Signature]
12/08/24
HoD-MBA



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DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH

ASSIGNMENT - II

Semester: II

AY: 2023-24

Course Name: Research Methodology & IPR

Sub Code: 22MBA23

Date of Assignment: 12/09/2024

Date of Submission: 14/09/2023

Q.No.	Questions	CO's	RBTL
1	Explain different types of attitude measurement scale with an example.	2	2
2	What is Sample? Explain different types of samples with example	2	2
3	Briefly explain different types of Experimental Research Design.	2	2

CO2: Apply a range of quantitative / qualitative research techniques to business and day to day management problems

Usha G
12/09/24
Course Co-ordinator

[Signature]
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DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH

ASSIGNMENT – III

Semester: II

AY: 2023-24

Course Name: Research Methodology & IPR

Sub Code: 22MBA23

Date of Assignment: 07/10/2024

Date of Submission: 10/10/2023

Q.No.	Questions	CO's	RBTL
1	Explain various forms of Intellectual Property and its impact on the changing global business environment.	5	2
2	Explain Data Analysis and Data Interpretation in detail.	3	2
3	Explain the importance of Report writing.	3	2

CO3: Demonstrate knowledge and understanding of data analysis, interpretation and report writing.

CO5: Discuss various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR.

Usha B
10/10/24
Course Co-ordinator

HOD-MBA



Department of Management Studies & Research

AY: 2023 – 2024 (even semester)


1st Internal Assessment Test Time Table

This is to bring to the notice of 2nd semester students that ~~Third~~^{1st} Internal Assessment will start from 19th of Aug 2024. The detailed time table is given below.

Date	Time	Semester/Subject Code
		II semester – 2022 Scheme
19/08/2024 (Monday)	10.00 am – 11.30 am	HRM (22MBA21)
	2.00 pm – 3.30 pm	FM (22MBA22)
20.08.2024 (Tuesday)	10.00 am – 11.30 am	RM&IPR (22MBA23)
	2.00 pm – 3.30 pm	OR (22MBA24)
21.08.2024 (Wednesday)	10.00 am – 11.30 am	SM (22MBA25)
	2.00 pm – 3.30 pm	ME (22MBA26)

- All three internal assessments are mandatory.
- 85% of attendance and submission of assignments is must to attend the IA.
- Students will not be allowed into the test room without ID card.
- Smart watches, Mobile phones are strictly not allowed into the test room.
- All the students must bring pen, pencil, scale on their own.
- Students should maintain discipline in the exam hall.


TEST COORDINATOR


CONVENER 5/8/24


HOD


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DON BOSCO INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH
B-FORM 2nd SEM (FIRST INTERNALS) EVEN SEM.

ROOM: B-301 SUB CODE: 22MBA23 DATE: 20/08/24 TIME: 10 - 11:30 AM

SL.NO	NAME	USN	SIGNATURE
1	ABHISHEK P	1DB23BA001	Abhishek P
2	ADARSH GONDAKAR	1DB23BA002	Adarsh G
3	AKSHATHA G RAO	1DB23BA003	Akshatha G R
4	ANU P	1DB23BA004	Anu P
5	ARPITHA K G	1DB23BA005	Arpitha K G
6	B SHARANAREDDI	1DB23BA006	Sharanareddi
7	BASAVARAJ HULYAL	1DB23BA007	B. S. Hulyal
8	BINDHU SHREE N H	1DB3BA008	Bindhu S N H
9	CHANDAN S	1DB23BA009	Chandan S
10	CHANDANA S	1DB23BA010	Chandana S
11	CHANDANA S	1DB23BA011	Chandana S
12	DARSHAN M	1DB23BA012	Darshan M
13	DARSHAN V	1DB23BA013	Darshan V
14	GURUPRASAD B	1DB23BA014	Guruprasad B
15	HEMANTH RAJ R	1DB23BA015	Hemant Raj R
16	JAYARAJA NAIK B R	1DB23BA016	Jayaraja N B R
17	JEEVITHA R	1DB23BA017	Jeevitha R
18	KAVANA M P	1DB23BA018	Kavana M P
19	KAVANA R	1DB23BA019	Kavana R
20	KAVANA V	1DB23BA020	Kavana V
21	KAVYA V	1DB23BA021	Kavya V
22	KEERTHANA D	1DB23BA022	Keerthana D
23	KIRAN KUMAR H M	1DB23BA023	Kiran Kumar H M
24	KIRAN KUMAR M S	1DB23BA024	Kiran Kumar M S
25	LAKSHITHA G	1DB23BA025	Lakshitha G
26	M R MOHAN RAJ	1DB23BA026	M. R. Mohan Raj
27	MAHESHA G S	1DB23BA027	Mahesh G S
28	MALLIKARJUNA SWAMY T P	1DB23BA028	Mallikarjuna S W T P
29	MITHUN M R	1DB23BA029	Mithun M R
30	MOHAMMED RAHIF	1DB23BA030	Mohammed Rahif

TOTAL STUDENTS: 30

TOTAL PRESENT: 29

ROOM INVIGILATOR

Subha S
Solankar

HOD-MBA

D. D. D. D.
20/08/24

DON BOSCO INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH
B-FORM 2nd SEM. (FIRST INTERNALS) EVEN SEM.

ROOM: B-302 SUB CODE: 22MBA23 DATE: 20/08/24 TIME: 10 - 11.30 AM

SL.NO	NAME	USN	SIGNATURE
31	MOHAMMED SAAD KHAN	1DB23BA031	
32	MOHAMMED YUSUF SULTAN	1DB23BA032	
33	NALINA B H	1DB23BA033	
34	NANDAN N	1DB23BA034	
35	NANDITHA M	1DB23BA035	
36	NIKITHA B H	1DB23BA036	
37	NIYATHI T	1DB23BA037	
38	PASHUPATHI M	1DB23BA038	
39	PRAJNA MALLAPPA DINNI	1DB23BA039	
40	PREETI L	1DB23BA040	
41	R SHARAVANI	1DB23BA041	
42	RAKESHA A	1DB23BA042	
43	RANJITH L	1DB23BA043	
44	S SUMANTH GOWDA	1DB23BA044	
45	SAINATH	1DB23BA045	
46	SAMUEL JOHN MOBBU	1DB23BA046	
47	SASTRI C K	1DB23BA047	
48	SHEETHAL S	1DB23BA048	
49	SHIVAKUMAR K B	1DB23BA049	
50	SHREYA C	1DB23BA050	
51	SHRUTHI K S	1DB23BA051	
52	SIVAGURUNATHAN N	1DB23BA052	
53	SUJITH G S	1DB23BA053	
54	TANUSHA Y A	1DB23BA054	
55	TEJASWINI J	1DB23BA055	
56	VAIBHAV G	1DB23BA056	
57	VAISHNAVI V	1DB23BA057	
58	VARSSHITH N L	1DB23BA058	
59	VENKATESH PRASAD K N	1DB23BA059	

TOTAL STUDENTS: 29

TOTAL PRESENT: 28

ROOM INVIGILATOR

HOD-MBA



Department of Management Studies & Research
AY: 2023 – 2024 (even semester)
2nd Internal Assessment Test Time Table

This is to bring to the notice of 2nd Semester students that Second Internal Assessment will start from 23rd of Sept. 2024. The detailed time table is given below.

Date	Time	Semester/Subject Code
		II semester – 2022 Scheme
23/09/2024 (Monday)	10.00 am – 11.30 am	HRM (22MBA21)
	2.00 pm – 3.30 pm	FM (22MBA22)
24.09.2024 (Tuesday)	10.00 am – 11.30 am	RM&IPR (22MBA23)
	2.00 pm – 3.30 pm	OR (22MBA24)
25.09.2024 (Wednesday)	10.00 am – 11.30 am	SM (22MBA25)
	2.00 pm – 3.30 pm	ME (22MBA26)

- All three internal assessments are mandatory.
- 85% of attendance and submission of assignments is must to attend the IA.
- Students will not be allowed into the test room without ID card.
- Smart watches, Mobile phones are strictly not allowed into the test room.
- All the students must bring pen, pencil, scale on their own.
- Students should maintain discipline in the exam hall.


TEST COORDINATOR


CONVENOR


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Bangalore - 74

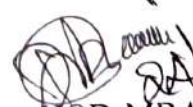

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SL.NO	NAME	USN	SIGNATURE
1	ABHISHEK P	1DB23BA001	Abhishek P
2	ADARSH GONDAKAR	1DB23BA002	Adarsh G
3	AKSHATHA G RAO	1DB23BA003	Akshatha G
4	ANU P	1DB23BA004	Anu P
5	ARPITHA K G	1DB23BA005	Arpitha
6	B SHARANAREDDI	1DB23BA006	Sharanareddi
7	BASAVARAJ HULYAL	1DB23BA007	Basavaraj
8	BINDHU SHREE N H	1DB3BA008	Bindhu
9	CHANDAN S	1DB23BA009	Chandan S
10	CHANDANA S	1DB23BA010	Chandana S
11	CHANDANA S	1DB23BA011	Chandana S
12	DARSHAN M	1DB23BA012	Darshan M
13	DARSHAN V	1DB23BA013	Darshan V
14	GURUPRASAD B	1DB23BA014	Guruprasad B
15	HEMANTH RAJ R	1DB23BA015	Hemant Raj R
16	JAYARAJA NAIK B R	1DB23BA016	Jayaraja Naik B.R
17	JEEVITHA R	1DB23BA017	Jeevitha R
18	KAVANA M P	1DB23BA018	Kavana M P
19	KAVANA R	1DB23BA019	Kavana R
20	KAVANA V	1DB23BA020	Kavana V
21	KAVYA V	1DB23BA021	Kavya V
22	KEERTHANA D	1DB23BA022	Keethana D.
23	KIRAN KUMAR H M	1DB23BA023	Kiran Kumar H M
24	KIRAN KUMAR M S	1DB23BA024	Kiran Kumar M S
25	LAKSHITHA G	1DB23BA025	Lakshitha G
26	M R MOHAN RAJ	1DB23BA026	M.R. Mohan Raj
27	MAHESHA G S	1DB23BA027	Mahesh G S
28	MALLIKARJUNA SWAMY T P	1DB23BA028	Mallikarjuna
29	MITHUN M R	1DB23BA029	Mithun M R
30	MOHAMMED RAHIF	1DB23BA030	Mohammed Rahif

TOTAL STUDENTS: 30

TOTAL PRESENT: 30.


ROOM INVIGILATOR


HOD-MBA

DON BOSCO INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH
B-FORM 2nd SEM. (2ND INTERNALS) EVEN SEM.(RM&IPR)

ROOM: B-302

SUB CODE: 22MBA23 DATE: 24/09/24

TIME: 10 - 11.30 AM

SL.NO	NAME	USN	SIGNATURE
31	MOHAMMED SAAD KHAN	1DB23BA031	<i>saadkhan</i>
32	MOHAMMED YUSUF SULTAN	1DB23BA032	<i>yusuf</i>
33	NALINA B H	1DB23BA033	<i>Nalina B.H</i>
34	NANDAN N	1DB23BA034	<i>Nandan</i>
35	NANDITHA M	1DB23BA035	<i>Nanditha M.</i>
36	NIKITHA B H	1DB23BA036	<i>Nikitha B.H</i>
37	NIYATHI T	1DB23BA037	<i>Niyathi T</i>
38	PASHUPATHI M	1DB23BA038	<i>Pashupathi M</i>
39	PRAJNA MALLAPPA DINNI	1DB23BA039	<i>Prajna</i>
40	PREETI L	1DB23BA040	<i>Preeti L</i>
41	R SHORAVANI	1DB23BA041	<i>Rshoravani</i>
42	RANJITH L	1DB23BA043	<i>Ranjith L</i>
43	S SUMANTH GOWDA	1DB23BA044	<i>Ssumanth</i>
44	SAINATH	1DB23BA045	<i>Sainath</i>
45	SAMUEL JOHN MOBBU	1DB23BA046	<i>Samuel</i>
46	SASTRI C K	1DB23BA047	<i>Sastri C.K</i>
47	SHEETHAL S	1DB23BA048	<i>Sheethal S</i>
48	SHIVAKUMAR K B	1DB23BA049	<i>Shivakumar K.B</i>
49	SHREYA C	1DB23BA050	<i>Shreya C</i>
50	SHRUTHI K S	1DB23BA051	<i>Shruthi K.S</i>
51	SIVAGURUNATHAN N	1DB23BA052	<i>Sivagurunathan N</i>
52	SUJITH G S	1DB23BA053	<i>Sujith G.S</i>
53	TANUSHA Y A	1DB23BA054	<i>Tanusha Y.A</i>
54	TEJASWINI J	1DB23BA055	<i>Tejaswini J</i>
55	VAIBHAV G	1DB23BA056	<i>Vaibhav G</i>
56	VAISHNAVI V	1DB23BA057	<i>Vaishnavi V</i>
57	VARSSHITH N L	1DB23BA058	<i>Varsshith N.L</i>
58	VENKATESH PRASAD K N	1DB23BA059	<i>Venkatesh P.K.N</i>

TOTAL STUDENTS: 28

TOTAL PRESENT: 28

Red
ROOM INVIGILATOR

D. Deepa
24/09/24
HOD-MBA



Department of Management Studies & Research
AY: 2023 – 2024 (Even Semester)
3rd Internal Assessment Test Time Table

This is to bring to the notice of 2nd Semester students that 3rd Internal Assessment will start from 16th of Oct. 2024. The detailed time table is given below.

Date	Time	Semester/Subject Code
		II semester – 2022 Scheme
16/10/2024 (Wednesday)	10.00 am – 11.30 am	HRM (22MBA21)
	2.00 pm – 3.30 pm	FM (22MBA22)
17/10/2024 (Thursday)	10.00 am – 11.30 am	RM&IPR (22MBA23)
	2.00 pm – 3.30 pm	OR (22MBA24)
18/10/2024 (Friday)	10.00 am – 11.30 am	SM (22MBA25)
	2.00 pm – 3.30 pm	ME (22MBA26)

- All three internal assessments are mandatory.
- 85% of attendance and submission of assignments is must to attend the IA.
- Students will not be allowed into the test room without ID card.
- Smart watches, Mobile phones are strictly not allowed into the test room.
- All the students must bring pen, pencil, scale on their own.
- Students should maintain discipline in the exam hall.

TEST COORDINATOR

CONVENER

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DON BOSCO INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH
B-FORM 2nd SEM (3rd INTERNALS) EVEN SEM.(RM&IPR)

ROOM: B-303 SUB CODE: 22MBA23 DATE: 17/10/24 TIME: 10.00 - 11.30AM

SL.NO	NAME	USN	SIGNATURE
1	ABHISHEK P	1DB23BA001	Abhishek P
2	ADARSH GONDAKAR	1DB23BA002	Ab
3	AKSHATHA G RAO	1DB23BA003	Ab
4	ANU P	1DB23BA004	Ab
5	ARPITHA K G	1DB23BA005	Ab
6	B SHARANAREDDI	1DB23BA006	Ab
7	BASAVARAJ HULYAL	1DB23BA007	Basavaraj Hulyal
8	BINDHU SHREE N H	1DB3BA008	Bindhu Shree N H
9	CHANDAN S	1DB23BA009	Chandan S
10	CHANDANA S	1DB23BA010	Chandana S
11	CHANDANA S	1DB23BA011	Ab
12	DARSHAN M	1DB23BA012	Darshan M
13	DARSHAN V	1DB23BA013	Darshan V
14	GURUPRASAD B	1DB23BA014	Ab
15	HEMANTH RAJ R	1DB23BA015	Hemant Raj R
16	JAYARAJA NAIK B R	1DB23BA016	Jaya
17	JEEVITHA R	1DB23BA017	Ab
18	KAVANA M P	1DB23BA018	Ab
19	KAVANA R	1DB23BA019	Ab
20	KAVANA V	1DB23BA020	Ab
21	KAVYA V	1DB23BA021	Ab
22	KEERTHANA D	1DB23BA022	Ab
23	KIRAN KUMAR H M	1DB23BA023	Kiran Kumar H.M
24	KIRAN KUMAR M S	1DB23BA024	Kiran Kumar M.S
25	LAKSHITHA G	1DB23BA025	Ab
26	M R MOHAN RAJ	1DB23BA026	M.R.Mohan Raj
27	MAHESHA G S	1DB23BA027	Ab
28	MALLIKARJUNA SWAMY T P	1DB23BA028	Ab
29	MITHUN M R	1DB23BA029	Ab
30	MOHAMMED RAHIF	1DB23BA030	Mohammed Rahif

TOTAL STUDENTS: 30

TOTAL PRESENT: 13

Room Invigilator
 17/10/24

K. [Signature]

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DON BOSCO INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT STUDIES AND RESEARCH

B-FORM 2nd SEM. (3rd INTERNALS) EVEN SEM.(RM&IPR)

ROOM: B-304

SUB CODE: 22MBA23

DATE: 17/10/24

TIME:10- 11.30 AM

SL.NO	NAME	USN	SIGNATURE
31	MOHAMMED SAAD KHAN	1DB23BA031	<i>[Signature]</i>
32	MOHAMMED YUSUF SULTAN	1DB23BA032	<i>yusuf</i>
33	NALINA B H	1DB23BA033	ABSENT
34	NANDAN N	1DB23BA034	ABSENT
35	NANDITHA M	1DB23BA035	<i>Nanditha-M</i>
36	NIKITHA B H	1DB23BA036	ABSENT
37	NIYATHI T	1DB23BA037	ABSENT
38	PASHUPATHI M	1DB23BA038	<i>Pashupathi M</i>
39	PRAJNA MALLAPPA DINNI	1DB23BA039	ABSENT
40	PREETI L	1DB23BA040	ABSENT
41	R SHARAVANI	1DB23BA041	ABSENT
42	RANJITH L	1DB23BA043	<i>Ranjith L</i>
43	S SUMANTH GOWDA	1DB23BA044	ABSENT
44	SAINATH	1DB23BA045	<i>Sainath</i>
45	SAMUEL JOHN MOBBU	1DB23BA046	ABSENT
46	SASTRI C K	1DB23BA047	ABSENT
47	SHEETHAL S	1DB23BA048	ABSENT
48	SHIVAKUMAR K B	1DB23BA049	<i>Shiva</i>
49	SHREYA C	1DB23BA050	ABSENT
50	SHRUTHI K S	1DB23BA051	<i>Shruthi K S</i>
51	SIVAGURUNATHAN N	1DB23BA052	<i>[Signature]</i>
52	SUJITH G S	1DB23BA053	ABSENT
53	TANUSHA Y A	1DB23BA054	ABSENT
54	TEJASWINI J	1DB23BA055	<i>Tejaswini J</i>
55	VAIBHAV G	1DB23BA056	ABSENT
56	VAISHNAVI V	1DB23BA057	<i>Vaishnavi V</i>
57	VARSSHITH N L	1DB23BA058	<i>[Signature]</i>
58	VENKATESH PRASAD K N	1DB23BA059	ABSENT

TOTAL STUDENTS: 28

TOTAL PRESENT: 12

ROOM INVIGILATOR

[Signature]
17/10/24

HOD-MBA

[Signature]
17/10/24

Head of Department

MBA Department

DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalagodu, Mysore Road

Bangalore - 74



DON BOSCO INSTITUTE OF TECHNOLOGY
Kumbalagodu, Mysore Road, Bengaluru – 560074
Department of Artificial Intelligence & Data Science
Internal Assessment Test-I



Course Name: **Artificial Intelligence**
Course Code: BAD402
Semester: IV

Date: 10/06/2024
Time: 3.00 p.m. - 4.15 p.m.
Max marks: 40

Note: Answer any Two full questions, choosing only One full question from each part
Each full question carries a maximum of 20 marks

20/1

Q. No	Part-A	MARKS	CO	RBTL
1	a) Define artificial intelligence (AI) and its key characteristics.	6	1	2
	b) Explain the historical development of AI, highlighting key milestones and breakthroughs	7	1	2
	c) Explain the learning agent with the help of a suitable diagram.	7	1	3
or				
2	a) Explain different types of Agents	10	1	2
	b) Explain the "Structure of Agents with Agent properties".	10	1	2
Q. No	Part-B	MARKS	CO	RBTL
3	a) Explain with examples i. Toy Problems ii. Real World Problems	10	2	2
	b) Explain the principles of breadth-first search as a problem-solving strategy and Provide a step-by-step illustration of how breadth-first search works.	10	2	3
or				
4	a) Outline the key principles of Depth-First Search and Iterative deepening DFS as uninformed search strategies.	10	2	3
	b) Explain problem solving agents with a suitable example.	10	2	2

Course Outcomes: -

CO1: Apply knowledge of agent architecture, searching and reasoning techniques for different applications.

CO 2. Compare various Searching and Inferencing Techniques.

Name & Signature of Course Instructor:

Scrutinized by (Name & Signature)

HoD



Don Bosco Institute of Technology, Bangalore
Kumbalagodu, Mysore Road, Bangalore 74
 Department of Artificial Intelligence and Data Science
 Internal Assessment Test - 1/2/3
 SCHEME OF EVALUATION



Name of the Course: Artificial Intelligence Course Code:
 Faculty Name: Dr. Nagaraj P Date:

Semester: IV
 Max Marks: 40

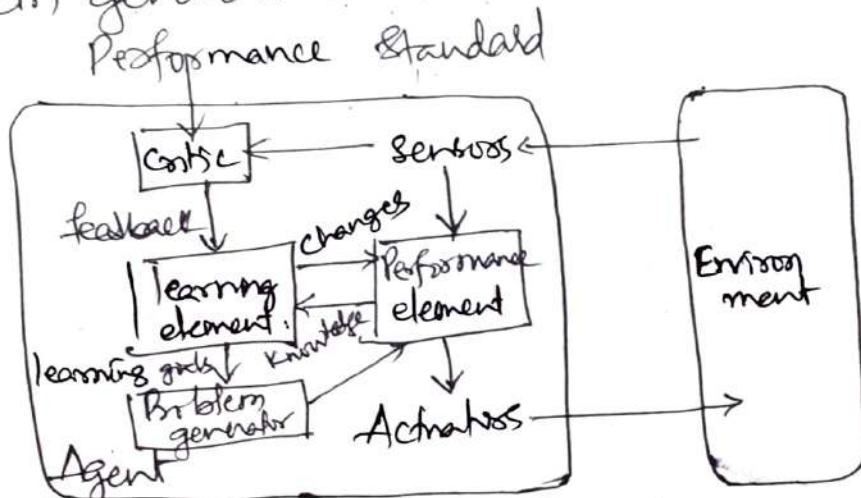
Q.no	SCHEME & SOLUTION	Marks
Q1a)	<p>Artificial Intelligence refers to the simulation of human intelligence in machines that are programmed to think & act like humans.</p> <p>Approaches to AI</p> <ol style="list-style-type: none"> 1. Thinking humanly (The cognitive modelling approach) 2. Thinking rationally (The laws of thought approach) 3. Acting humanly (Turing test approach) 4. Acting rationally (The rational agent approach) 	6m
1b)	<p><u>Historical development of AI.</u></p> <p>Maturation of Artificial Intelligence (1943-1952)</p> <p>1943 - Warren McCulloch & Walter Pitts Artificial neurons.</p> <p>Hebbian learning - 1949</p> <p>Turing test - 1950.</p> <p>The birth of AI (1952 - 1956)</p> <p>FORTRAN, LISP & COBOL are invented</p> <p>Golden years - Early enthusiasm (1956 - 1974)</p> <p>First AI winter (1974 - 1980)</p> <p>A boom on AI (1980 - 87)</p> <p>Second AI winter (1987 - 1993)</p> <p>Emergence of intelligent agents (1993 - 2011)</p> <p>Deep learning, big data & AI (2011 till present)</p>	7m

Q.1c) Learning agents

After an agent is programmed, can't work immediately. NO. it needs to learn. we have to teach the agent by giving it a set of examples. Test it by using another set of examples. we then say the agent learns - A learning agent. A learning agent has four components

- Learning element
- Performance element
- critic
- Problem generator

- (4m)



A general learning agent

- (3m)

Q.2 a) Different types of agents.

- Simple reflex agent
- Model based reflex agent
- Goal based agents
- Utility based agents
- Learning agents.

10m

- (2m)

b) Structure of agents

The job of AI is to design an agent program that implements the agent function - the mapping from percepts to actions. Program will run on some computing device with sensors & actuators - called as architecture.

Agent = architecture + program

Skeleton of agent program: The Table driven agent program is invoked for each new percept & returns an action each time. It retains the complete percept sequence in memory.

function Table-driven-agent(percept) returns

an action,
 Persistent - percepts, a sequence, initially empty
 table, a table of actions, indexed by
 Percept sequences, initially fully sensed
 append percept to the end of percepts
 action ← lookup(percepts, table)
 return action.

Q3 a) Explain with examples. Toy problems & real world problems.

A toy problem is intended to illustrate or exercise various problem solving methods. It can be given a concise, exact description & hence is usable by different researchers to compare the performance of algorithms.

10m

10m

Examples of Toy problems.

Vacuum world, 8-Puzzle, 8 Queens (5m)

A real world problem is one whose solutions people actually care about. Such problems tend not to have a single agreed upon description, but can give the general flavor of their formulations. (5m)

Examples of real world problems.

Route finding algorithms, Touring problems, Travelling Salesperson problem, VLSI layout, Robot navigation, Automatic assembly sequencing, Protein design. (5m)

Q3 b) Breadth first search is the most common search strategy for traversing a tree or graph. This algorithm searches breadthwise in a tree or graph, so it is called BFS. BFS is implemented using FIFO queue data structure. 10m

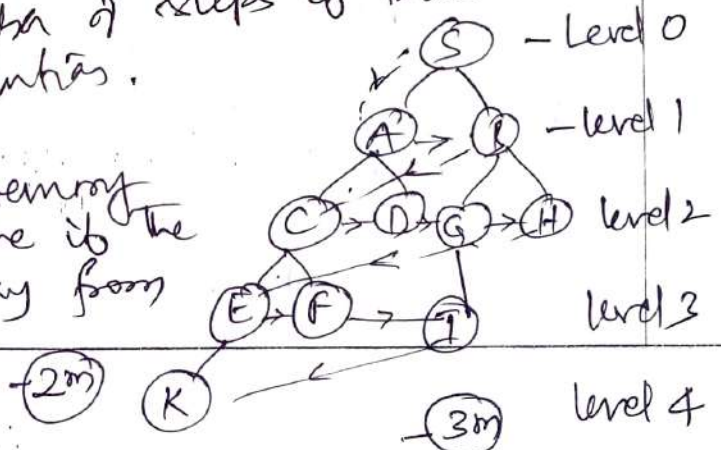
function Breadth-First-Search (problem) returns a solution or failure. (5m)

Advantages:

- BFS provides a solution if solution exists
- BFS provides minimal solution which require less number of steps if there are more than one solutions.

Disadvantages:

- requires lot of memory
- requires more time if the solution is far away from the root node.



(2m)

(3m)

a) Depth First Search always expands the deepest node in the current frontier of a search tree.

DFS is an instance of graph search algorithm

DFS uses LIFO Queue.

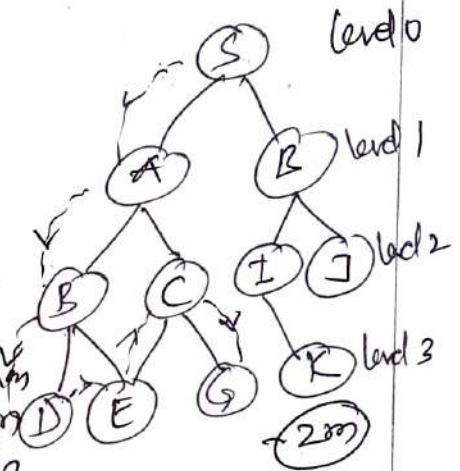
DFS uses a stack data structure for its implementation

Advantages:

- requires less memory
- requires less time to reach goal node than BFS.

Disadvantages:

- many states keep reoccurring & no guarantee of finding a solution
- DFS algorithm goes for deep down searching & it may go to infinite loop.



Iterative deepening algorithm is a combination of DFS & BFS algorithms.

This algorithm finds out the best depth limit & does it by gradually increasing the limit until a goal is found.

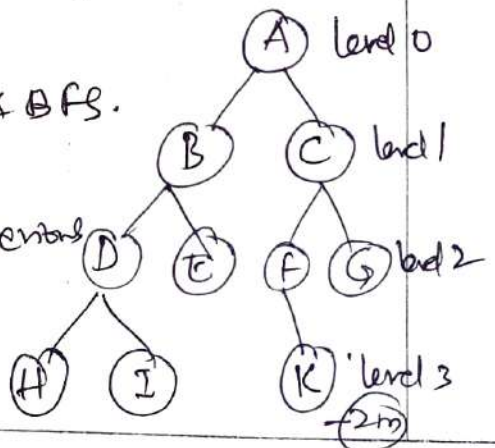
This algorithm combines benefits of both BFS's fast search & DFS's memory efficiency. It is useful when search space is large.

Advantage:

Combines benefit of both DFS & BFS.

Disadvantage:

It repeats all the work of previous phase.



Q.4 b) Problem solving agent is a kind of goal based agent. It solves problems by finding sequence of actions that lead to desirable states. To solve a problem goal formulates in the first step & goal is formulated as set of world states in which the goal state is satisfied.

10m

Problem formulation is the process of deciding what actions & states to consider.

Searching algorithm takes problem as input & returns a solution in the form of an action sequence. (4m)

Once the solve is formed, the actions it recommends can be carried out. This is called execution phase. (3m)

There are two types of search algorithms

1. Uninformed Search 2. Informed Search

a) BFS

b) DFS

c) Uniform cost search

d) Depth limited search

e) Iterative deepening DFS

f) Bidirectional search

a) Best first search

b) A* search

c) AO* search

d) Hill climbing algorithm.

(3m)

US
N

1	D	B							
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DON BOSCO INSTITUTE OF TECHNOLOGY

Kumbalagodu, Mysore Road, Bengaluru - 560074

Department of Artificial Intelligence & Data Science

Internal Assessment Test-II



Course Name: Artificial Intelligence

Course Code: BAD402

Semester: IV

Date: 29/07/2024

Time: 3.00 p.m. - 4.15 p.m.

Max marks: 40

Note: Answer any Two full questions, choosing only One full question from each part
Each full question carries a maximum of 20 marks

Good

Q. No	Part-A	MARKS	CO	RBTL
1	a) Describe the principles of greedy best-first search as an informed search strategy. How does it make use of heuristic information?	10	3	2
	b) Define knowledge-based agents and explain their role in AI systems. How do they differ from other types of intelligent agents?	10	3	2
	OR			
2	a) Define informed search strategies in the context of AI. How do they differ from uninformed search strategies?	6	3	2
	b) Describe the Wumpus World environment and its significance in AI. What challenges do the Wumpus World pose for intelligent agents?	7	3	2
	c) Explain the A* search algorithm, emphasizing the role of heuristic functions in its operation.	7	3	2
Q. No	Part-B	MARKS	CO	RBTL
3	a) Describe the principles of forward chaining in FOL. Provide examples to illustrate how forward chaining works in practice.	10	4	2
	b) Explain the concept of Unification in First Order Logic. How does Unification contribute to the process of reasoning?	10	4	3
	OR			
4	a) Explain the concept of resolution in FOL. How does resolution contribute to resolution-based inference process and explain resolution with an example?	8	4	3
	b) State Baye's Rule and explain its significance in updating probabilities based on new evidence.	7	4	2
	b) Define the concept of independence in probability theory. How does the independence of variables affect the joint distribution?	5	4	2

Course Outcomes: -

CO 3. Develop knowledge base sentences using propositional logic and first order logic

CO 4. Describe the concepts of quantifying uncertainty.

Name & Signature of Course Instructor:

Scrutinized by (Name & Signature)

HoD



Don Bosco Institute of Technology, Bangalore
Kumbalagodu, Mysore Road, Bangalore 74
 Department of Artificial Intelligence and Data Science
 Internal Assessment Test - 1 / 2 / 3
SCHEME OF EVALUATION



Name of the Course: Artificial Intelligence Course Code: BAD 402 Semester: IV
 Faculty Name: Dr. Nagasaja P. Date: 29/07/2024 Max Marks: 40

Q.no	SCHEME & SOLUTION	Marks																						
Q 1	<p>a) <u>Best First Search Algorithm</u></p> <p>It selects the path which appears best at that moment. It is the combination of DFS & BFS. It uses the heuristic function & search. It takes advantages of both DFS & BFS algorithms. In each step it chooses most promising node. Expand the node which is closest to goal node & the closest cost is estimated by heuristic function. It evaluates the nodes by using $f(n) = h(n)$</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 1;"> <table border="1"> <thead> <tr> <th>node</th> <th>$h(n)$</th> </tr> </thead> <tbody> <tr><td>A</td><td>12</td></tr> <tr><td>B</td><td>4</td></tr> <tr><td>C</td><td>7</td></tr> <tr><td>D</td><td>3</td></tr> <tr><td>E</td><td>8</td></tr> <tr><td>F</td><td>2</td></tr> <tr><td>H</td><td>4</td></tr> <tr><td>I</td><td>9</td></tr> <tr><td>S</td><td>13</td></tr> <tr><td>G</td><td>0</td></tr> </tbody> </table> </div> </div> <p><u>Solution:</u> $S \rightarrow B \rightarrow F \rightarrow G$</p>	node	$h(n)$	A	12	B	4	C	7	D	3	E	8	F	2	H	4	I	9	S	13	G	0	10m
node	$h(n)$																							
A	12																							
B	4																							
C	7																							
D	3																							
E	8																							
F	2																							
H	4																							
I	9																							
S	13																							
G	0																							
Q 1	<p>b) Knowledge based agents have the capability of maintaining an internal state of knowledge, reason over knowledge, update their knowledge after observations & take action. These agents represent the world with formal representation & act intelligently.</p>	10m																						

Knowledge based agent give current situation in the form of sentences. They have complete knowledge of current situation of environment & its surroundings. These agents manipulate knowledge to infer new things at "Knowledge level". Knowledge based agent must be able to do the following.

represent state, actions etc

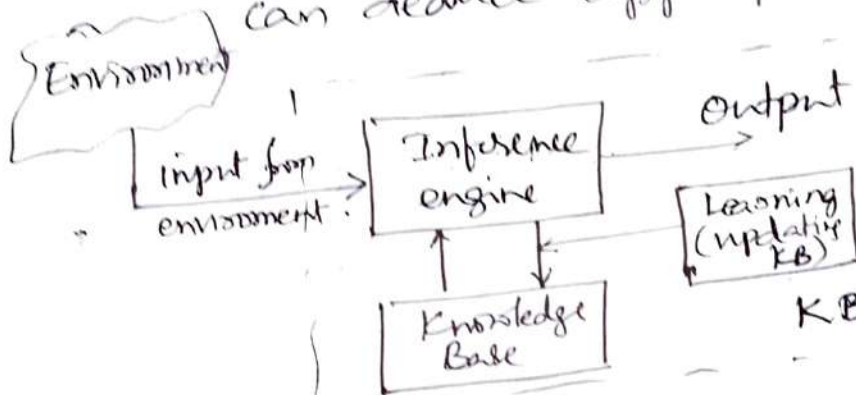
incorporate new percepts

can update internal representation of world

can deduce internal representation of world

can deduce appropriate actions.

(7m)



(3m)

Q2 a) Informed search algorithms contain an array of knowledge about search space. It knows how far we are from goal, path cost, how to reach goal node etc. This knowledge help agents to explore less to the search space & find more efficiently the goal node. It is useful for large search space. It uses the idea of heuristic, so it is called heuristic search.

Uninformed

1. Search without information
2. No knowledge
3. more complexity
4. Also known as Blind search
5. It finds solution slow as compared to an informed search
6. It is always complete
7. Cost is high
8. Ex: DFS, BFS

Informed

1. Search with information
2. Use knowledge to find steps to solution
3. Less complexity
4. Known as Heuristic search
5. It finds solution quickly
6. May not be complete
7. Cost is low
8. Ex Greedy search, A* search, AO* search, Hill climbing algorithm.

Q2 6) Wumpus world Example:

It is an example of knowledge based agent that represents knowledge reasoning and planning. It is a cave with 4x4 rooms connected with passage ways. The cave has some rooms - pits, treasure and a beast named Wumpus. Agent has to find gold & climb out of cave without fallen into pits or eaten by Wumpus. The agent will get reward if he comes with gold & he will get a penalty if eaten by Wumpus or falls into pit.

S		B	P
W	T	P	B
S		B	
A	B	P	B

Explanation upto solution (500)
 A = agent.
 B = Breeze
 T = Treasure
 S = Stench
 W = Wumpus
 P = Pit

700

(200)

Q.no	SCHEME	Marks
Q2	<p>c) A* Search</p> <p>It uses heuristic function $h(n)$ & cost to reach the node n from the start node. It finds shortest path through search space using the heuristic function. It is similar to uniform cost search (UCS) except that it uses $g(n) + h(n)$ instead of $g(n)$. (6m)</p> <p>$f(n) = g(n) + h(n)$ with example</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Estimated cost of cheapest solution </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Cost to reach node n from start state </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Cost to reach from node n to goal node </div> </div> <p style="text-align: right;">-1m</p>	7m
Q3	<p>a) Forward Chaining Algorithm</p> <p>Starting from the known facts, it triggers all the rules whose premises are satisfied, adding their conclusions to the known facts. The process repeats until the query is answered or no new facts are added.</p> <p>It is bottom-up approach, as it moves from bottom to top. It is also called as data driven approach as we reach to goal using available data. It is used in expert systems, such as CLIPS, business & production rule systems. (5m)</p> <p>Example to decide Robert as Criminal (5m)</p>	10m
Q3	<p>b) unification means making expressions look identical. This is done with the process of substitution. (10m)</p>	10m

Lifted inference rules require finding solutions that make different logical expressions look identical. This process is called unification & is the key component of first order logic. The UNIFY algorithm takes two sentences & returns a unifier for them if one exists. (5m)

$UNIFY(p, q) = \theta$ where $SUBST(\theta, p) = SUBST(\theta, q)$ & returns fail if the expressions do not match with each other. The substitutions variables are called most general unifier (MGU). (2m)

EX: $\psi_1 = \{prime(11)\}$ & $\psi_2 = \{prime(y)\}$

So $\Rightarrow \{prime(11), prime(y)\}$

$SUBST \theta = \{11/y\}$

$S_1 = \{prime(11), prime(11)\}$

Successfully unifier Unifier: $\{11/y\}$ (3m)

Q.4 a) Resolution is a theorem proving technique that proceeds by building refutation rules in part by contradictions. Resolution is used if there are various statements & we need to prove a solution by conclusions of those statements. Unification is the key concept of proofs by resolution. Resolution is a single inference rule which can efficiently update by operating on CNF. (8m)

Steps for resolution

1. Conversion of facts into first order logic
2. Convert FOR statements into CNF
3. Negate the statement which needs to prove
4. Draw resolution graphs (unification) (3m)

Example with steps - (5m)

Q4 b) Bayes rule

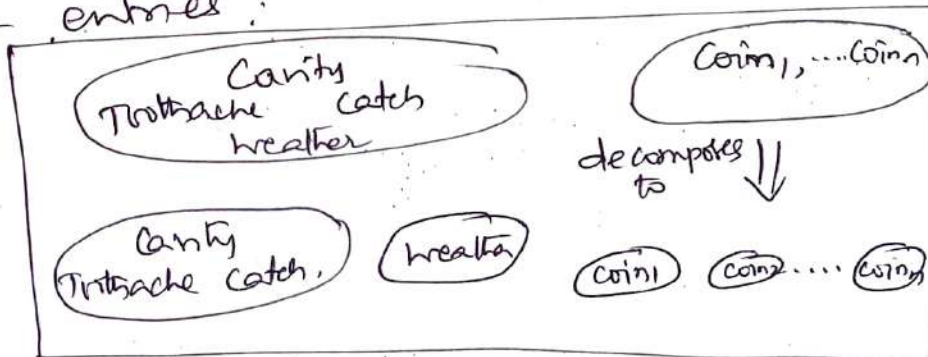
$$P(a \cap b) = P(a|b)P(b) = P(b|a)P(a)$$

$$\therefore P(b|a) = \frac{P(a|b)P(b)}{P(a)}$$

This equation is known as Bayes rule. This simple equation underlies most modern AI systems for probabilistic inference. We will also have occasion to use a more general version conditionalized on some background evidence e : $P(x|y, e)P(y|e)$ (5m)

$$P(y|x, e) = \frac{P(x|y, e)P(y|e)}{P(x|e)} \quad (2m)$$

Q4 C) the full joint distribution $P(\text{Toothache}, \text{Cavity}, \text{Weather})$ which has $2 \times 2 \times 2 \times 4 = 32$ entries: 5m



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DON BOSCO INSTITUTE OF TECHNOLOGY
Kumbalagodu, Mysore Road, Bengaluru – 560074
Department of Artificial Intelligence & Data Science
Internal Assessment Test-I



Course Name: Object-Oriented Programming with JAVA

Course Code: BCS306A ✓

Date: 13-01-2024

Time: 10.00 a.m. - 11.15 a.m.

Semester: III

Max marks: 40

8/1/24

*Note: Answer any Two full questions, choosing only One full question from each part
Each full question carries a maximum of 20 marks*

Q NO	Part-A	MARKS	CO	RBTL
1.	a. Explain object-oriented principles.	6	1	1,2
	b. Explain the scope and lifetime of variables with an example.	7	1	1,2,3
	c. Discuss various primitive datatypes in JAVA	7	1	1,2,3
OR				
2	a. Explain four different types of if statements in JAVA.	10	1	1,2,3
	b. Explain different Lexical issues in JAVA.	10	1	1,2,3
3.	a) Explain Garbage collection in JAVA	6	2	1
	b) Explain how to create a class and class objects with an example.	7	2	1,2,3
	c) What is a constructor? Mention Types and explain with examples.	7	2	1,2,3
OR				
4.	a) Explain function overloading with an example.	10	2	1,2,3
	b) Explain the keywords this, final, public, static, void	10	2	1,2,3

Course Outcomes: -

At the end of the course, the student will be able to

CO1: Demonstrate proficiency in writing simple programs involving branching and looping structures.

CO2: Design a class involving data members and methods for the given scenario.

Name & Signature of Course Instructor:

Scrutinized by (Name & Signature) HOD

Dr. Ramesh
Ramesh

Sampath Kumar.S. Jauramma



Don Bosco Institute of Technology, Bangalore
Kumbalagodu, Mysore Road, Bangalore 74

Department of Artificial Intelligence & Data Science

Internal Assessment Test - M2+3

SCHEME OF EVALUATION



Name of the Course: ^{Object oriented programming with Java} Course Code: BCS306A

Semester: III

Faculty Name: Dr. Ranjini P S Date: 13/01/2024

Max Marks: 40

Q.no	SCHEME & SOLUTION	Marks
1 a)	<p>Three oops principles - Encapsulation, Inheritance, Polymorphism</p> <p>Encapsulation - binds code & data together - keep safe from using private, public, protected key words - keep the data safe outside interference & misuse.</p> <p>Inheritance - process by which one object acquires the properties of another object, supports hierarchical classification. By use of inheritance a class has to define only those qualities that make it unique, The general qualities can be derived from parent class.</p> <p>Polymorphism - (means many forms) - is a feature that allow use One interface to be used for a general class of actions</p>	3x2=6
b)	<p>Scope & life time of a variable - 1) Instance variables - A variable that is declared inside a class, but declared outside any methods and blocks is known as instance variable. Lifetime - until the object of the class stays in memory.</p> <p>Scope - throughout the class, except in static methods</p> <p>class variable - That is declared inside the class outside all blocks, & is declared as static</p> <p>Scope: throughout the class Lifetime - Until the end of the program.</p> <p>local variables - All variables which are not instance or class variables are known as local variable.</p> <p>lifetime - Until control leaves the block. Scope: within the block. it is declared</p>	1M 2x3=6

Q.no	SCHEME	Marks
	<p>The Technique that accomplishes is called garbage collection. Garbage collection sporadically occurs during the execution of your program. It happens when objects created are no longer used.</p>	6M.
b)	<p>Class: classname { instance variables; instance variables; method name } To create objects, need obj class name obj1 = new classname - class name. () = a.</p>	4M. 3M.
c)	<p>Constructors - non Arg constructor, parameterized constructor, Default constructor. It is called constructor b/c it constructs the values at the time of object creation. Automatic initialization of variables happens through constructor. A constructor initializes an object immediately upon creation. It has same name as class name. Constructors don't have a return type, it is different from method but working is same as that of method. Example</p>	5M. 2M.
Le a)	<p>Overloading - In Java it is possible to define two or more methods within same class that share the same names as long as their parameter declarations are same. In this case methods are said to be overloaded & process referred to as method overloading. Using m. over loading Java supports polymorphism.</p>	

Q.no	SCHEME	Marks
	<p>invoked it. It To allow this, Java defines this keyword. This can be used inside any method to refer to the current object. This keyword helps to overcome shadowing or instance variable hiding. This keyword helps to call an overloaded constructor.</p> <p>Void - It is a return type that does not return any value.</p> <p style="text-align: right;">Jouranne</p>	



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Kumbalagodu, Mysore Road, Bengaluru – 560074
Department of Artificial Intelligence & Data Science
Internal Assessment Test-II



Course Name: Object-Oriented Programming with JAVA
Course Code: BCS306A
Date: 01-03-2024
Time: 10.00 a.m. - 11.15 a.m.
Semester: III

Max marks: 40

358

*Note: Answer any Two full questions, choosing only One full question from each part
Each full question carries a maximum of 20 marks*

Q NO	Part-A	MARKS	CO	RBTL
1.	a) Explain two uses of the super keyword with example.	6	3	1,2,3
	b) What is abstract class? Explain with example.	7	3	1,2,3
	c) What are Interfaces? Explain Interfaces in java.	7	3	1,2,3
OR				
2	a) Explain method overriding and give an example	6	3	1,2,3
	b) Explain different types of inheritance in JAVA.	7	3	1,2,3
	c) Explain the different methods available in object class	7	3	1,2,3
3.	a) What is an exception? Explain the terms try, catch, finally.	10	4	1,2,3
	b) Explain packages in Java with an example, also demonstrate how to access the classes from different packages	10	4	1,2,3
OR				
4.	a) Explain the term synchronization and develop a program to show synchronization in Java.	10	5	1,2,3
	b) What is Thread? Explain the two ways of creating a Thread in Java	10	5	1,2,3

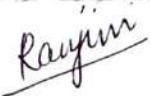
Course Outcomes: -

At the end of the course, the student will be able to

CO3: Apply the concepts of inheritance and interfaces in solving real world problems.

CO4: Use the concept of packages and exception handling in solving complex problem.

CO5: Apply concepts of multithreading, autoboxing and enumerations in program development


Name & Signature of Course Instructor:


Scrutinized by (Name & Signature) HOD



Don Bosco Institute of Technology, Bangalore
Kumbalagodu, Mysore Road, Bangalore 74
 Department of Artificial Intelligence & Data Science
 Internal Assessment Test - 1 / 2 / 3
 SCHEME OF EVALUATION



Name of the Course: *Object oriented programming with Java*
 Faculty Name: *Dr. Ranjit P.S*

Course Code: *BCS206A*
 Date: *01-03-2024*

Semester: *3*
 Max Marks: *40.*

Q.no	SCHEME & SOLUTION	Marks
1 a)	<p>super keyword - is a reference variable which is used to refer immediate parent class object. Whenever you create the instance of subclass, an instance of parent class is created implicitly which is referred by super reference variable. Uses 1) super can be used to refer immediate parent class instance variable.</p> <p>2) super can be used to invoke immediate parent class method</p> <p>3) used to invoke immediate parent class constructor</p> <p>eg: <pre>class Animal { String color = "white"; } class dog extends Animal { String color = "black"; void printColor() system.out.println(color); → Dog class system.out.println(super.color) → Animal class } }</pre></p>	<p>3M</p> <p>3M.</p>
5)	<p>Abstract class - A class which is declared with abstract keyword is known as abstract class in Java. It can have abstract & non abstract methods. It is the process of hiding implementation details & showing only functionality.</p> <p>Abstract class Bike { abstract void run(); } class Honda4 extends Bike { void run() { system.out.println("running sabely"); } public static void main (String bike obj = new Honda4 (); obj.run(); } }</p>	<p>3M</p> <p>4M</p>

Q.no	SCHEME	Marks
24)	object class - methods - toString() → get unique string representation of object hashCode() → unique representation of object equals() → Two objects are equal or not finalize(), getClass(), clone(), wait(), notify(), notifyAll()	7x1=7
3a)	An exception is an unwanted or unexpected event, that occurs during execution, of a program, at run time, that disrupts the normal flow of the program's instructions. Exception can be caught & handled by the program User defined exception: Built in exceptions → Arithmetic exception, class cast exception, null pointer exception, Array index out of bounds exception, Array store exception, checked exceptions - Class not found exception,	2M
b)	Interrupted exception, IOException, SQLException, FileNotFoundException, InstantiationException, InterruptedException.	5M
b)	packages - mechanism to encapsulate a group of classes & interfaces. Packages are used for sub packages, <ol style="list-style-type: none"> 1) preventing naming conflicts, 2) making searching, locality & use of classes, interfaces 3) providing controlled access can be considered as data encapsulation.	3M
	<pre> package pack1; public class A { public void </pre>	4M.

Q.no	SCHEME	Marks
c)	<p>Interfaces - Interface specifies the behaviour of a class/procedure as an abstract type. Interfaces are used to ^{define} abstraction. Interface can be defined as a container that stores the signature of the methods to be implemented in the code segment.</p>	7M
2)	<p>Method overriding - Method overriding occurs when a subclass has the same method as parent class. In other words method overriding occurs when a subclass provides a particular implementation of a method declared by one of its parent class.</p> <pre> class Vehicle { void run() { system.out.println("Vehicle is running"); } } class Bike extends Vehicle { public static void main (String args[] { Bike obj = new Bike (); obj.run(); } } </pre>	3M
5)	<p>Different Inheritance → 1) Single inheritance 2) Multilevel inheritance, 3) Hierarchical inheritance 4) Hybrid inheritance.</p> <p>Single inheritance → The subclass derived from a superclass inherits the properties & behaviours of a si</p> <p>Multilevel Inheritance - A class is derived from a class which is also derived from another class is called multilevel inheritance</p> <p>Hierarchical Inheritance - If a no. of classes are derived from a single base class, it is called Hierarchical inheritance.</p> <p>Hybrid inheritance - means more than one, it is a combination of 2 or more types of inheritance</p>	4+3 = 7

Q.no	SCHEME	Marks
5)	object class - methods - toString() → get unique string representation of object hashCode() → Unicode representation of object equals() → Two objects are equal or not finalize(), getClass(), clone(), wait(), notify(), notifyAll()	7x1=7
3 a)	An exception is an unwanted or unexpected event, that occurs during execution, of a program, at run time, that disrupts the normal flow of the program's instructions. Exception can be caught & handled by the program	2M
	User defined exception: Built in exceptions → Arithmetic exception, class cast exception, NullPointerException, Array index out of bounds exception, Array store exception unchecked exceptions - Class not found exception,	5M
b)	InterruptedException, IOException, SQLException, FileNotFoundException, InterruptedException, InterruptedException	3M
b)	packages - mechanism to encapsulate a group of classes & interfaces, Packages are used for subpackages,	3M
	1) preventing naming conflicts, 2) making searching, locality & use of classes, interfaces (3) providing controlled access	3M
	(4) can be considered as data encapsulation. package pack1; public class A { public void	4M

Q.no	SCHEME	Marks
4a)	<p>Synchronization - is the process that allows only one thread at a particular time to complete the given task entirely.</p> <pre> public class CalcCounter { int calcCount = 0; public synchronized void increment () { calcCount++; } public class Team implements Runnable { CalcCounter counter; Team (CalcCounter counter) { this.counter = counter; } public void run () { for (int i = 0; i < 1000; i++) counter.increment (); } } public class Synchronization { public static void main (String[] args) { CalcCounter counter = new CalcCounter (); Thread Team1 = new Thread (new Team (counter)); Thread Team2 = new Thread (new Team (counter)); Team1.start (); Team2.start (); try { Team1.join (); Team2.join (); } catch (Exception e) { } System.out.println (counter.calcCount); } } </pre>	3M
	<p>b) Thread is a block of codes. only. There are two ways to create a thread. (1) By extending Thread class (2) By implementing Runnable interface.</p> <p>(1) Thread class provide constructors & methods to run threads</p> <p>(2) Another way to create thread is using Runnable interface. Java Runnable is an interface used to</p>	7M 3M.

Q.no	SCHEME	Marks
	<p>execute code on a concurrent thread. It is an interface which is implemented by any class. If we create the instances of that class, should be executed by a thread. A runnable interface has an undefined method run() with void as return type, and it takes no arguments. To implement a runnable, one has only to implement the run method.</p> <p>Example. → Any example</p>	3M 2M



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Special Internal Assessment Test



Course Name: Object-Oriented Programming with JAVA

Course Code: BCS306A

Date: 07-03-2024

Time: 3.00 p.m. - 4.15 p.m.

Semester: III

Max marks: 40

*Note: Answer any Two full questions, choosing only One full question from each part
Each full question carries a maximum of 20 marks*

Q NO	Part-A	MARKS	CO	RBTL
1.	a. Describe the meaning of each of the keywords in “public static void main”	6	1	1,2,3
	b. How are arrays initialized and declared in Java? Explain with suitable Examples.	7	1	1,2,3
	c. Write a program to sort the elements using for loop	7	1	1,2,3
OR				
2.	a. Explain the working of advanced for loop with an example.	10	1	1,2,3
	b. Demonstrate working of break , continue, highlight the differences, with example	10	1	1,2,3
3.	a) Explain Garbage collection in JAVA	6	2	1
	b) Write a JAVA program demonstrating Method overloading.	7	2	1,2,3
	c) What is a constructor? Mention Types and explain with examples.	7	2	1,2,3
OR				
4.	a) Explain function overloading with an example.	10	2	1,2,3
	b) Demonstrate Switch cases with an example	10	2	1,2,3

Course Outcomes: -

At the end of the course, the student will be able to

CO1: Demonstrate proficiency in writing simple programs involving branching and looping structures.

CO2: Design a class involving data members and methods for the given scenario.

Name & Signature of Course Instructor:

Scrutinized by (Name & Signature)

HOD

Q.no	SCHEME	Marks
<u>1a</u>	<p>Public :- Access specifier that declares main method & makes it accessible to all other classes. 2M</p> <p>Static :- defines that belongs to the entire class and not for a particular object of class. Main must always be declared as static. 2M</p> <p>Void :- specifies that the method main does not return any value. 2M</p> <p>Main :- This is the starting point of interpreter from where it starts executing. A java program can have any number of classes but only one class will have main method.</p>	
<u>1b</u>	<p><u>Declaration</u></p> <p><code>int[] numbers;</code></p> <p>numbers is declared as an integer array. 2M</p> <p><u>Initialization</u></p> <p><code>numbers = new int[5];</code></p> <p>initialized with a size of 5 using the new keyword. 2M</p> <p><code>int[] numbers = new int[5];</code></p> <p>This combines both the declaration and initialization in a single line. It declares an integer array named numbers and initializes it with a size of 5. 3M</p>	

1c

```

package xxx ;
import java.util. ArrayList ;
public class For loop {
    public static void main (String [] args) {
        ArrayList <String> list = new ArrayList <String> ();
        list.add ("Vimal");
        list.add ("sonoo");
        list.add ("salon");
        for (String s : list)
            System.out.println ("First element of array is " + s);
    }
}

```

7M

2aAdvanced for loop.

The for loop is looping construct which can execute a set of instruction a specified number of times.

syntax:-
 For (initialization; condition; iteration) {
 // body
 }

Example

```

public class for loop {
    public static void main (String [] args) {
        int sum = 0;
        int i;
        for (i = 1; i <= 10; i++)
            sum = sum + i;
    }
}

```

3M

10M

Q.no

SCHEME

Marks

2bContinue

```

public class Continue {
    public static void main (String [] args) {
        int count = 0;
        while (count < 5) {
            count ++;
            if (count % 2 == 0) {
                continue;
            }
            System.out.println (" current count : " + count);
        }
    }
}

```

5/10

Break

It is used to exit a loop permanently.

It ensures that loop is terminated based on certain condition

5/10

```

public class break {
    public static void main (String [] args) {
        int count = 0;
        do {
            System.out.println (count);
            count ++;
            if (count == 5) {
                break;
            }
        } while (count < 10);
    }
}

```

Q.no	SCHEME	Marks
3a	<ul style="list-style-type: none"> • Dynamically allocated by using new operator, objects are destroyed & their memory released for later reallocation • Different approach it handles deallocation for you automatically • The technique that accomplishes this is called garbage collection. • When no reference to an object exist the object is assumed to be no longer needed, & the memory occupied by the object can be reclaimed • Only occure occur sporadically during the execution of your program. • It will not occur simply because 1 or more object exist that are no longer used. 	10/20
3b	<pre> public class overloading { void test () { System.out.println ("Printing is happen"); } void test (int i) { System.out.println ("square of number is" + (i*i)); } void test (int i, int j) { System.out.println ("The sum of number is" + (i+j)); } void test (int i, int j, int k) { System.out.println ("Product of numbers" + (i*j*k)); } } </pre>	7/11

Q.no

SCHEME

Marks

```

public static void main (String [] args) {
    overloading object = new overloading ();
    object . Test ();
    object . Test (4);
    object . Test (2, 3);
    object . Test (2, 3, 4);
}
}

```

3L

It constructs the values at time of object creation.

① No Arg constructor

- If we do not create constructor then java compiler will create a default constructor.
- If we create our own constructor with 0 argument then it is no arg constructor.

3M

② public class Box

```

int length;
int width;
int breadth;
int volume;
Box () {
    length = 2;
    width = 3;
    breadth = 5;
}
int volume () {
    return (length * width * breadth);
}

```

4M


```

public static void main (String[] args) {
    Box Box1 = new Box();
    Box Box2 = new Box();
    System.out.println ("Volume of Box 1 is" + Box1.Volume());
    " — " — " (" — " — Box2 is" + Box2.Volume());
}

```

(i) Parameterized constructor:

- Take 1 or more parameter as argument.
- Initialize the object with values passed by the user.

```

public class Box() {
    int length;
    int width;
    int breadth;
    Box (int l; int w; int b) {
        length = l;
        width = w;
        breadth = b;
    }
    int volume () {
        return (length * width * breadth);
    }
}
public static void main (String[] args) {
    Box.Box 1 = new Box (2, 3, 4);
    Box.Box 2 = new Box (3, 4, 5);
    System.out.println ("Volume of box 1 is" + Box1.Volume());
    System.out.println ("Volume of box 2 is" + Box2.Volume());
}

```

(ii) Default constructor: it is created by compiler itself when the programmer doesn't create any constructor. Initialize the attribute of the object with their default values.

4(a) In Java, it is possible to define two or more methods within the same class that share the same name as long as their parameters declarations are different.

(0M)

- In method overloading is one of the ways that Java supports polymorphism.
- Overloaded methods must differ in the type & for number of their parameters.
- While overloaded methods may have different return types, -the return type alone is insufficient to distinguish two versions of a method.

ex:-

```
public class calculator {
    public int add (int a, int b) {
        return a+b;
    }
    public int add (int a, int b, int c) {
        return a+b+c;
    }
    public string add (string str1, string str2) {
        return str1+str2;
    }
    public static void main (String [] args) {
        calculator calculator = new calculator();
        int sum1 = calculator.add(5, 10);
        system.out.println ("sum of integers", sum1)
    }
}
```

Q.no	SCHEME	Marks
	<pre>int sum 2 = calculator.add (5, 10, 15); System.out.println ("sum of 3 integers" + sum 2); String concatenated string = calculator. add ("Hello", "world!"); System.out.println ("concatenated string"); }</pre>	